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\$IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s): Oxman et al.

Group Art Unit: 3732

Serial No.: 10/643,748

Examiner: John J. Wilson

Filed: 19 August 2003

Docket No.: 58614US002

Confirmation No.: 4133

Title: DENTAL ARTICLE FORMS AND METHODS

Mail Stop Appeal Brief - Patents

Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

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CERTIFICATE UNDER 37 CFR §1.10:"Express Mail" mailing label number: EM 118968662 USDate of Deposit: June 16, 2008

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By: Dani MorozName: Dani Moroz

(LARGE ENTITY TRANSMITTAL UNDER RULE 1.10)



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PATENT
Docket No. 58614US002
(M&R 100.58614010)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appellant(s): Oxman et al.)	Group Art Unit:	3732
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Serial No.: 10/643,748)	Examiner:	John J. Wilson
Confirmation No.: 4133)		
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For: DENTAL ARTICLE FORMS AND METHODS)		

APPEAL BRIEF

Commissioner for Patents
Mail Stop Appeal Brief - Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

This Brief is presented in support of the Appeal filed herewith, from the final rejection, issued 14 April 2008, of claims 39 and 42-71 of the above-identified application under 37 C.F.R. §§1.113 and 1.191.

This Brief is being submitted as set forth in 37 C.F.R. § 41.37. Please charge Deposit Account No. 13-4895 the fee for filing this Brief under 37 C.F.R. § 41.20(b)(2).

I. REAL PARTY IN INTEREST

The real party in interest of the above-identified patent application is the assignee, 3M Innovative Properties Company, as evidenced by an assignment recorded at Reel 014849, Frame 0865, on 5 January 2004.

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Appeal Brief

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For: DENTAL ARTICLE FORMS AND METHODS

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II. RELATED APPEALS AND INTERFERENCES

There are no appeals or interferences known to Appellant's Representatives which would directly affect, be directly affected by, or have a bearing on the Board's decision in the pending appeal.

III. STATUS OF CLAIMS

The present application was filed with claims 1-44. During prosecution of the application, claims 45-71 were added, and claims 1-38, 40, and 41 were cancelled. Claims 39 and 42-71 remain pending and are rejected.

Claims 39 and 42-71 are pending and are the subject of this appeal (see Claim Appendix).

IV. STATUS OF AMENDMENTS.

No amendments have been presented after issuance of the Final Office Action dated 14 April 2008.

V. SUMMARY OF CLAIMED SUBJECT MATTER.

Claim 39 recites a method of preparing a dental article. *See, e.g.*, Appellants' specification at page 4, lines 17-18. The method includes: selecting a dental article form having a self-supporting structure including a first shape that includes a reservoir, wherein the self-supporting structure is formed from an organic composition having sufficient malleability to be formed into a second shape, wherein the organic composition gives the self-supporting structure its self-supporting and malleable characteristics, and further wherein the organic composition is dimensionally stable and comprises a

surfactant system mixed therein (*e.g.*, specification, page 2, lines 26-28; page 4, lines 1-3 and 18-19; page 5, lines 3-5 and 19-22; page 12, lines 13-21; and page 12, line 29 to page 13, line 6). The method further includes filling the reservoir with one or more hardenable dental materials (*e.g.*, specification, page 4, line 19); placing the dental article form filled with one or more hardenable dental materials on a subject's tooth structure (*e.g.*, specification, page 4, lines 20-21); at least partially hardening the hardenable material to form the dental article (*e.g.*, specification, page 4, lines 22-23); optionally customizing the dental article outside of the subject's mouth (*e.g.*, specification, page 4, lines 23-24); cementing the dental article to the subject's tooth structure (*e.g.*, specification, page 4, line 24); and removing the dental article form from the article (*e.g.*, specification, page 4, line 25); wherein the dental article form is reshaped while in the subject's mouth after filling the reservoir with the hardenable dental material (*e.g.*, specification, page 4, lines 25-27).

Claim 45 also recites a method of preparing a dental article (*e.g.*, specification, page 4, lines 17-18). The method of claim 45 includes: selecting a dental article form having a self-supporting structure including a first shape that includes a reservoir, wherein the self-supporting structure is formed from an organic composition having sufficient malleability to be formed into a second shape, wherein the organic composition gives the self-supporting structure its self-supporting and malleable characteristics (*e.g.*, specification, page 2, lines 26-28; page 4, lines 1-3 and 18-19; page 5, lines 3-5 and 19-22; page 12, lines 13-21; and page 12, line 29 to page 13, line 6). The method of claim 45 further includes filling the reservoir with one or more hardenable dental materials (*e.g.*, specification, page 4, line 19); placing the dental article form filled with one or more hardenable dental materials on a subject's tooth structure (*e.g.*, specification, page 4, lines 20-21); at least partially hardening the hardenable material in the reservoir to form the dental article (*e.g.*, specification, page 4, lines 22-23); optionally customizing the dental article outside of the subject's mouth (*e.g.*, specification, page 4, lines 23-24); cementing the dental article to the subject's tooth structure (*e.g.*, specification, page 4, line

24); and removing the dental article form from the dental article (*e.g.*, specification, page 4, line 25); wherein the dental article form is reshaped while in the subject's mouth after filling the reservoir with the hardenable dental material (*e.g.*, specification, page 4, lines 25-27).

Claim 58 recites a further method of preparing a dental article (*e.g.*, specification, page 4, lines 17-18). The method of claim 58 includes: selecting a dental article form having a self-supporting structure including a first shape that includes a reservoir, wherein the self-supporting structure is formed from an organic composition having sufficient malleability to be formed into a second shape, wherein the organic composition gives the self-supporting structure its self-supporting and malleable characteristics (*e.g.*, specification, page 2, lines 26-28; page 4, lines 1-3 and 18-19; page 5, lines 3-5 and 19-22; and page 12, line 29 to page 13, line 6). The method of claim 58 additionally includes filling the reservoir with one or more hardenable dental materials (*e.g.*, specification, page 4, line 19); placing the dental article form filled with one or more hardenable dental materials on a subject's tooth structure (*e.g.*, specification, page 4, lines 20-21); hardening the hardenable material in the reservoir to form the dental article and cement it to the subject's tooth structure (*e.g.*, specification, page 4, lines 22-24); and removing the dental article form from the dental article (*e.g.*, specification, page 4, line 25); wherein the dental article form is reshaped while in the subject's mouth after filling the reservoir with the hardenable dental material (*e.g.*, specification, page 4, lines 25-27).

Claim 65 recites another method of preparing a dental article (*e.g.*, specification, page 4, lines 17-18). The method recited in claim 65 includes: selecting a dental article form having a self-supporting structure including a first shape that includes a reservoir, wherein the self-supporting structure is formed from an organic composition having sufficient malleability to be formed into a second shape, wherein the dental article form does not include slots (*e.g.*, specification, page 2, lines 26-28; page 4, lines 1-3 and 18-19; page 5, lines 3-5 and 19-22; page 12, line 29 to page 13, line 6; and Figures 1-5 which do not show a slot). The method of claim

65 further includes filling the reservoir with one or more hardenable dental materials (*e.g.*, specification, page 4, line 19); placing the dental article form filled with one or more hardenable dental materials on a subject's tooth structure (*e.g.*, specification, page 4, lines 20-21); at least partially hardening the hardenable material in the reservoir to form the dental article (*e.g.*, specification, page 4, lines 22-23); optionally customizing the dental article outside of the subject's mouth (*e.g.*, specification, page 4, lines 23-24); cementing the dental article to the subject's tooth structure (*e.g.*, specification, page 4, line 24); and removing the dental article form from the dental article (*e.g.*, specification, page 4, line 25); wherein the dental article form is reshaped while in the subject's mouth after filling the reservoir with the hardenable dental material (*e.g.*, specification, page 4, lines 25-27).

Claim 66 recites yet another method of preparing a dental article (*e.g.*, specification, page 4, lines 17-18). The method recited in claim 66 includes: selecting a dental article form having a self-supporting structure comprising a first shape that includes a reservoir, wherein the self-supporting structure is formed from an organic composition having sufficient malleability to be formed into a second shape, wherein the dental article form does not include slots (*e.g.*, specification, page 2, lines 26-28; page 4, lines 1-3 and 18-19; page 5, lines 3-5 and 19-22; page 12, line 29 to page 13, line 6; and Figures 1-5 which do not show a slot). The method of claim 66 additionally includes filling the reservoir with one or more hardenable dental materials (*e.g.*, specification, page 4, line 19); placing the dental article form filled with one or more hardenable dental materials on a subject's tooth structure (*e.g.*, specification, page 4, lines 20-21); hardening the hardenable material in the reservoir to form the dental article and cement it to the subject's tooth structure (*e.g.*, specification, page 4, lines 22-24); and removing the dental article form from the dental article (*e.g.*, specification, page 4, line 25); wherein the dental article form is reshaped while in the subject's mouth after filling the reservoir with the hardenable dental material (*e.g.*, specification, page 4, lines 25-27).

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL.

A. Whether claims 39, 42-44, and 67 are patentable under 35 U.S.C. §103(a) over U.S. Patent No. 3,585,723 (Simor) in view of U.S. Patent No. 3,565,387 (Neustadter et al.), U.S. Patent No. 4,113,499 (Ivanov et al.), and U.S. Patent No. 5,487,663 (Wilson).

B. Whether claims 45, 46, 48-55, 58, 60-66, and 68-71 are patentable under 35 U.S.C. §103(a) over U.S. Patent No. 3,585,723 (Simor) in view of U.S. Patent No. 3,565,387 (Neustadter et al.) and U.S. Patent No. 5,487,663 (Wilson).

C. Whether claims 47 and 59 are patentable under 35 U.S.C. §103(a) over U.S. Patent No. 3,585,723 (Simor) in view of U.S. Patent No. 3,565,387 (Neustadter et al.) and U.S. Patent No. 5,487,663 (Wilson) as applied to claim 45, and further in view of U.S. Patent No. 4,113,499 (Ivanov et al.).

D. Whether claim 56 is patentable under 35 U.S.C. §103(a) over U.S. Patent No. 3,585,723 (Simor) in view of U.S. Patent No. 3,565,387 (Neustadter et al.) and U.S. Patent No. 5,487,663 (Wilson) as applied to claim 45, and further in view of U.S. Patent No. 5,102,332 (Uthoff).

E. Whether claim 57 is patentable under 35 U.S.C. §103(a) over U.S. Patent No. 3,585,723 (Simor) in view of U.S. Patent No. 3,565,387 (Neustadter et al.) and U.S. Patent No. 5,487,663 (Wilson) as applied to claim 45, and further in view of U.S. Patent No. 3,949,476 (Kahn).

F. Whether claims 39 and 42-71 are patentable under the judicially created doctrine of obviousness-type double patenting over claims 1-54, 56-73, 75, and 79-88 of U.S. Patent Application Serial No. 10/219,398 in view of U.S. Patent No. 3,565,387 (Neustadter et al.).

VII. ARGUMENT

- A. **Claims 39, 42-44, and 67 are patentable under 35 U.S.C. §103(a) over U.S. Patent No. 3,585,723 (Simor) in view of U.S. Patent No. 3,565,387 (Neustadter et al.), U.S. Patent No. 4,113,499 (Ivanov et al.), and U.S. Patent No. 5,487,663 (Wilson).**

Claims 39, 42-44, and 67 stand rejected under 35 U.S.C. §103(a) over Simor in view of Neustadter et al., Ivanov et al., and Wilson. Appellants respectfully disagree and request review and reversal of this rejection by the Board.

Each of Appellants' claims recites a dental article form that includes an organic composition (including a surfactant system mixed therein) in the form of a self-supporting structure having a first shape and sufficient malleability to be formed into a second shape. This is describing the organic composition that is used to make the dental article form (as opposed to the hardenable dental material that is placed within the reservoir of the dental article form).

"The term 'self-supporting' means that the composition is dimensionally stable and will maintain its shape (e.g., preformed shape of a crown form) without significant deformation at room temperature (i.e., about 20°C to about 25°C) for at least about two weeks when free-standing (i.e., without the support of packaging or a container). Preferably, the compositions of the present invention are dimensionally stable at room temperature for at least about one month, and more preferably, for at least about six months. Preferably, the compositions of the present invention are dimensionally stable at temperatures above room temperature, more preferably up to about 40°C, even more preferably up to about 50°C, and even more preferably up to about 60°C. This definition applies in the absence of conditions that activate an initiator system (if present) and in the absence of an external force other than gravity." (Specification, page 5, lines 3-14).

"The term 'sufficient malleability' means that the self-supporting structure is capable of being custom shaped and fitted, for example, to a patient's mouth, under a moderate force (i.e., a force that ranges from light finger pressure to that applied with manual operation of a small hand tool, such as a dental composite instrument). Herein, the phrase 'malleable' refers to a material that is malleable under conditions in the mouth or that can be comfortably withstood by oral tissue (e.g., temperature and/or oral fluids, including water)." (Specification, page 5, lines 15-22).

As an example of the forms recited by Appellants' claims 39, 42-44, and 67, in the case of a crown such as that recited in claim 67, the present invention provides a dental crown form having a reservoir filled with a material that will form the ultimate crown (after removal of the crown form). The crown form is then reshaped with the hardenable dental material in it while on a tooth stump, thereby causing the material in the reservoir to adopt the shape of the crown form. The hardenable dental material is at least partially hardened to form a dental crown, and then the crown form (used to form or mold the crown) is removed. Appellants assert that the documents cited by the Examiner do not provide the basis for a *prima facie* obviousness rejection.

Appellants respectfully point out that despite the ruling of *KSR International Co. v. Teleflex, Inc.* (82 USPQ2d 1385 (2007)), a rejection made on the basis of obviousness still requires that all of the claim limitations be taught by the asserted modification or combination of cited references ("To support the conclusion that the claimed invention is directed to obvious subject matter, either the references must expressly or impliedly suggest the claimed invention or the examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references." M.P.E.P. §706.02(j), 8th Ed., Rev. 6 (Sept. 2007), page 700-48, citing, *Ex parte Clapp*, 227 USPQ 972, 973 (Bd. Pat. App. & Inter. 1985)). Appellants assert that in this rejection, as well as each of the other rejections made by the Examiner in the Final Office Action mailed 14 April 2008, the

proposed combination of references fails to teach or suggest each limitation of the rejected claims.

None of the cited documents, used in any combination, teach or suggest this reshaping step in the mouth after filling the reservoir. Not only do the combinations of documents lack the teaching of the desire to have a dental article form that can be reshaped in the mouth while a hardenable material for forming an ultimate dental article is within the reservoir of the form, there is no teaching or suggestion of how this could be accomplished.

For instance, Simor does not teach a crown form or the reshaping thereof. Simor teaches reshaping a crown *per se* while dental cement is between the crown and the tooth stump (e.g., col. 6, lines 55-58 and col. 8, lines 65-71). This cement is not, however, a hardenable material that forms a dental article upon removal of a form that shapes the dental article, particularly (as recited in claim 67) a dental article selected from the group consisting of a crown, an inlay, an onlay, a bridge, an orthodontic appliance, a maxillofacial prosthesis, and a tooth splint.

The Examiner, in the Final Office Action mailed 14 April 2008, cited Neustadter et al. for the disclosure of an organic composition for making a pattern for a dental article. Although Neustadter et al. do describe the use of a plastic such as “polyvinyl acetate, polyethylene and copolymers thereof” (col. 2, lines 45-47), which may or may not be malleable, and the desire to select materials having a shore A hardness of about 70 (col. 2, lines 56-57), which may or may not be malleable, there is no specific and enabling disclosure of an organic composition that is itself self-supporting and malleable.

Neustadter et al. describes dental patterns that include slot means for reshaping the pattern (e.g., col. 2, lines 11-16, “[t]he slot is relatively substantial width so that the width of the pattern can be narrowed sufficiently by pressing the edges together to partially or even fully close the slot the required amount to fit the prefabricated pattern into the space between the sides of the abutting or adjacent teeth”). Thus, Neustadter et al. show a form that requires a physical means,

a slot, to change shape. With respect to the use of the plastic materials discussed above, Neustadter et al. state that “[t]he plastic pattern should have the characteristic of (1) softness or pliability so that it can be adapted or modified by the technician and (2) retentivity so that it retains its modified shape” (col. 2, lines 52-55, emphasis added). Although this describes reshaping and retaining the shape, it is not clear that these desired characteristics come from the choice of materials for making the pattern (i.e., the selection of the plastic) or from the use of the slot means in the design of the pattern, particularly when the document is read as a whole. Simple reference to polyvinyl acetate, polyethylene and copolymers thereof does not necessarily provide sufficient description for one of skill in the art to select a composition that is both self-supporting and malleable. Thus, Neustadter et al. do not show a composition that is malleable and self-supporting.

Furthermore, although Neustadter et al. teach a dental pattern, e.g., a crown form, there is no reshaping of the pattern in the subject's mouth after filling the reservoir with a hardenable dental material that ultimately forms the dental article. The pattern is used in a casting process, which may involve the use of wax (with the wax being eventually burned out). Additionally, as placed in the record by Appellants response dated 21 August 2007 (page 11, 3rd full paragraph), simple reference to polyvinyl acetate, polyethylene and copolymers thereof does not necessarily provide sufficient description for one of skill in the art to select a composition that is both self-supporting and malleable. Thus, Neustadter et al. do not provide an enabling disclosure for selection of a composition that is malleable and self-supporting.

The Examiner acknowledged, in the Final Office Action mailed 14 April 2008, that this combination of three documents (Simor in view of Neustadter et al. and Ivanov et al.) fail to teach the step of removing the form recited in claims 39, 42-44, and 67. Thus, the Examiner cited Wilson for a disclosure of removing the dental article form from the dental article. Wilson does not, however, teach that the dental article form is self-supporting and malleable. Nor does

Wilson teach reshaping the dental article form in the subject's mouth. The reshaping discussed at column 4, lines 8-24, refers to reshaping the composite material remaining after removal of the crown form.

Claim 39, as well as claims 42-44 and 67 dependent thereto, recites that the dental article form is reshaped while in the subject's mouth after filling the reservoir with the hardenable dental material. As none of the cited documents teach or suggest this reshaping of the dental article form in the mouth after filling its reservoir with a hardenable dental material, Appellants assert that a *prima facie* case of obviousness has not been presented. As stated in Appellants' specification, "[t]he dental article form is sufficiently malleable in the oral environment such that the filled article form is easily customizable, which includes, for example, adjustment to width and marginal contacts of the crown form. This customization is done while the filled dental article form is seated on the prepared tooth stump, and while the hardenable dental material is still in the unhardened stage. The customization can be done by a variety of methods including applying pressure with fingers or an instrument of choice (e.g., hand operation of dental composite instrument) to provide optimum custom fit, including gingival, proximal, and occlusal fit." (Appellants' specification at page 13, lines 17-25).

Furthermore, there is no logical reason why one of skill in the art would combine the teachings of these three documents as proposed in support of this rejection. Even if there were such a reason, the organic composition of Neustadter et al. would be used to make the crown of Simor, which is not a crown form that is removed to form the ultimate crown. Furthermore, even with Wilson combined with Simor and Neustadter et al., there is no suggestion of reshaping a dental article form in the subject's mouth, particularly after filling the reservoir (of the dental article form) with the hardenable dental material that forms the ultimate dental article.

Additionally, although Ivanov et al. disclose a surfactant mixed in a disposable mold form, Ivanov et al. is directed to molds used in the foundry industry, a completely nonanalogous

technology area, and used for a completely different purpose. There is no teaching or suggestion that such molds could be used in a dental method, or any reason to believe that the compositions of such molds would be suitable for modification to be used in a dental article form in a subject's mouth.

It is submitted that the rejections may only be made by impermissible hindsight reconstruction, that is, by picking and choosing from each document that which supports these rejections. One cannot “simply [to] engage in a hindsight reconstruction of the claimed invention, using the Applicant’s structure as a template and selecting elements from references to fill the gaps.” *In re Gorman*, 933 F.2d 982, 18 U.S.P.Q.2d 1885, 1888 (Fed. Cir. 1991).

As asserted in *Princeton Biochemicals, Inc. v. Beckman Coulter, Inc.* 411 F.3d 1332, 75 U.S.P.Q.2d 1051 (Fed. Cir. 2005), 35 U.S.C. §103 specifically requires an assessment of the claimed invention “as a whole.” The “as a whole” assessment of the invention requires a showing that an artisan of ordinary skill in the art at the time of the invention, confronted by the same problems as the inventor and with no knowledge of the claimed invention, would have selected the various elements from the cited references and combined them in the claimed manner. In other words, 35 U.S.C. §103 requires some suggestion or motivation, before the invention itself, to make the new combination. See *In re Rouffet*, 149 F.3d 1350, 1355-56, 47 U.S.P.Q.2d 1453, 1457-58 (Fed. Cir. 1998).

In *KSR Int’l co. v. Teleflex Inc.*, 127 S.Ct. 1727; 167 L.Ed.2d 705; 82 USPQ2d (BNA) 1385 (2007), the U.S. Supreme Court has acknowledged the utility of this “teaching, suggestion, motivation” inquiry when determining the obviousness of an invention by recognizing that the inquiry arose from “helpful insight” of the Court of Customs and Patent Appeals. The inquiry arose as a guard against a finding of obviousness where an examiner or a court was able to find all of the elements of an invention in the prior art, but without any suggestion or motivation to combine the prior art references that described the elements in question. The Supreme Court

reiterated that “a patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art.” 167 L.Ed.2d at 14.

Furthermore, this “as a whole” instruction in 35 U.S. §103 prevents evaluation of the invention part by part, aided by the template of Appellants’ disclosure. Without this important requirement, an obviousness assessment might reduce an invention into its component parts, then find a reference corresponding to each component. This type of assessment would import hindsight into the obviousness determination by using the invention as a roadmap to find its prior art components. The U.S. Supreme Court cautioned against such analysis in *KSR*, stating, “A factfinder should be aware, of course, of the distortion caused by hindsight bias and must be cautious of arguments reliant upon *ex post* reasoning.” (167 L.Ed.2d at 725, citing *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1 (1966)). The Court also warned against a “temptation to read into the prior art the teachings of the invention in issue” and instructed courts to “‘guard against slipping into the use of hindsight’” (383 U.S., at 36, quoting *Monroe Auto Equipment Co. v. Heckethorn Mfg. & Supply Co.*, 332 F. 2d 406, 412 (CA6 1964))).

Appellants respectfully submit that these warnings have not been heeded and the rejections can on be supported by the use of impermissible hindsight reconstruction.

B. Claims 45, 46, 48-55, 58, 60-66, and 68-71 are patentable under 35 U.S.C. §103(a) over U.S. Patent No. 3,585,723 (Simor) in view of U.S. Patent No. 3,565,387 (Neustadter et al.) and U.S. Patent No. 5,487,663 (Wilson).

Claims 45, 46, 48-55, 58, 60-66, and 68-71 stand rejected under 35 U.S.C. §103(a) over Simor in view of Neustadter et al. and Wilson. Appellants respectfully disagree and request review and reversal of this rejection by the Board.

Appellants assert that independent claims 45, 58, 65, and 66 are patentable over the cited documents for reasons similar to those discussed, *supra*. For example, each of claims 45, 58, 65, and 66 recite a dental article form that is reshaped while in the subject's mouth. As none of the cited documents teach or suggest this reshaping of the dental article form in the mouth after filling its reservoir with a hardenable dental material, Appellants assert that, with respect to claims 45, 58, 65, and 66, a *prima facie* case of obviousness has not been presented.

In addition, as pointed out, *supra*, Neustadter et al. do not provide a specific and enabling disclosure of an organic composition that is itself self-supporting and malleable. It is not clear that the desired characteristic of reshaping and retaining the shape of the Neustadter et al. patterns comes from the slot means in the design of the pattern or from the choice of materials for making the pattern, particularly when Neustadter et al. is read as a whole. Thus, Neustadter et al. do not show a composition that is malleable and self-supporting.

Furthermore, Appellants respectfully point out that claims 65 and 66 specifically recite that the dental article form does not include slots. Neustadter et al., conversely, describe dental patterns that include slot means for reshaping the pattern (e.g., col. 2, lines 11-16, "[t]he slot is relatively substantial width so that the width of the pattern can be narrowed sufficiently by pressing the edges together to partially or even fully close the slot the required amount to fit the prefabricated pattern into the space between the sides of the abutting or adjacent teeth"). Thus, Neustadter et al. teach away from Appellants invention as recited in claims 65, 66, and claims dependent thereto. *KSR* indirectly affirms the principle that nonobviousness may be proven by a showing that the prior art teaches away from the claimed invention, 82 USPQ at 1399 (wherein the Court found that Teleflex failed to provide evidence supporting the contention that the prior art taught away from using Asano, stating that "Teleflex has not shown anything in the prior art that taught away from the use of Asano."). Thus, Appellants assert that by teaching away from the invention as recited in claims 65, 66, and claims dependent thereto, Neustadter et al. provide

evidence of nonobviousness of these claims.

In view of the foregoing comments, Appellants respectfully submit that the Examiner has not met the requisite burden to establish a *prima facie* case of obviousness of claims 45, 46, 48-55, 58, 60-66, and 68-71 over Simor, Neustadter et al., and Wilson.

C. Claims 47 and 59 are patentable under 35 U.S.C. §103(a) over U.S. Patent No. 3,585,723 (Simor) in view of U.S. Patent No. 3,565,387 (Neustadter et al.) and U.S. Patent No. 5,487,663 (Wilson) as applied to claim 45, and further in view of U.S. Patent No. 4,113,499 (Ivanov et al.).

Claims 47 and 59 stand rejected under 35 U.S.C. §103(a) over Simor in view of Neustadter et al. and Wilson as applied to claim 45, and further in view of Ivanov et al. Appellants respectfully disagree and request review and reversal of this rejection by the Board.

As discussed, *supra*, Appellants submit that claim 45 is not rendered obvious in view of the combination of Simor, Neustadter et al., and Wilson. Furthermore, the deficiency arising from this proposed combination, discussed, *infra*, is not remedied by the disclosure of Ivanov et al.

As pointed out in the first rejection, *supra*, with respect to claims including a surfactant, although Ivanov et al. disclose a surfactant mixed in a disposable mold form, Ivanov et al. is directed to molds used in the foundry industry, a completely nonanalogous technology area, and used for a completely different purpose. There is no teaching or suggestion that such molds could be used in a dental method, or any reason to believe that the compositions of such molds would be suitable for modification to be used in a dental article form in a subject's mouth. Also, there is no teaching or suggestion in Ivanov et al. of a dental article form that is reshaped while in the subject's mouth. Therefore, not only is it impermissible as hindsight reconstruction to combine the disclosure of Ivanov et al. with that of Simor, Neustadter et al., and Wilson, such a combination would not cure this deficiency pointed out by Appellants with regard to the

combination, namely that there is no teaching or suggestion of a dental article form that is reshaped while in the subject's mouth.

In view of the foregoing comments, Appellants respectfully submit that the Examiner has not met the requisite burden to establish a *prima facie* case of obviousness of claims 47 and 59 over Simor, Neustadter et al., and Wilson, and further in view of Ivanov et al.

D. Claim 56 is patentable under 35 U.S.C. §103(a) over U.S. Patent No. 3,585,723 (Simor) in view of U.S. Patent No. 3,565,387 (Neustadter et al.) and U.S. Patent No. 5,487,663 (Wilson) as applied to claim 45, and further in view of U.S. Patent No. 5,102,332 (Uthoff).

Claim 56 stands rejected under 35 U.S.C. §103(a) over Simor in view of Neustadter et al. and Wilson as applied to claim 45, and further in view of Uthoff. Appellants respectfully disagree and request review and reversal of this rejection by the Board.

As discussed, *supra*, Appellants submit that claim 45 is not rendered obvious in view of the combination of Simor, Neustadter et al., and Wilson. Furthermore, the deficiency, discussed, *infra*, is not remedied by the disclosure of Uthoff.

The Examiner introduced the disclosure of Uthoff to show use of packaging. Uthoff, however, does not teach or suggest a dental article form that is reshaped while in the subject's mouth. Thus, Uthoff does not remedy this deficiency of the combination of Simor, Neustadter et al., and Wilson in providing the embodiment of claim 45, from which claim 56 depends.

In view of the foregoing comments, Appellants respectfully submit that the Examiner has not met the requisite burden to establish a *prima facie* case of obviousness of claim 56 over Simor, Neustadter et al., and Wilson, and further in view of Uthoff.

- E. Claim 57 is patentable under 35 U.S.C. §103(a) over U.S. Patent No. 3,585,723 (Simor) in view of U.S. Patent No. 3,565,387 (Neustadter et al.) and U.S. Patent No. 5,487,663 (Wilson) as applied to claim 45, and further in view of U.S. Patent No. 3,949,476 (Kahn).

Claim 57 stands rejected under 35 U.S.C. §103(a) over Simor in view of Neustadter et al. and Wilson as applied to claim 45, and further in view of Kahn. Appellants respectfully disagree and request review and reversal of this rejection by the Board.

As discussed, *supra*, Appellants submit that claim 45 is not rendered obvious in view of the combination of Simor, Neustadter et al., and Wilson. Furthermore, the deficiency, discussed, *infra*, is not remedied by the disclosure of Kahn.

The Examiner introduced the disclosure of Kahn to show a handle removed from the base. Kahn, however, does not teach or suggest a dental article form that is reshaped while in the subject's mouth. Thus, Kahn does not remedy this deficiency of the combination of Simor, Neustadter et al., and Wilson in providing the embodiment of claim 45, from which claim 57 depends.

In view of the foregoing comments, Appellants respectfully submit that the Examiner has not met the requisite burden to establish a *prima facie* case of obviousness of claim 57 over Simor, Neustadter et al., and Wilson, and further in view of Kahn.

F. Whether claims 39 and 42-71 are patentable under the judicially created doctrine of obviousness-type double patenting over claims 1-54, 56-73, 75, and 79-88 of U.S. Patent Application Serial No. 10/219,398 in view of U.S. Patent No. 3,565,387 (Neustadter et al.).

Claims 39 and 42-71 stand provisionally rejected under the judicially created doctrine of obviousness-type double patenting over claims 1-54, 56-73, 75, and 79-88 of U.S. Patent Application Serial No. 10/219,398 in view of Neustadter et al.. Appellants respectfully disagree and request review and reversal of this rejection by the Board.

Appellants initially note that copending Application No. 10/219,398 has not yet issued.

Appellants respectfully point out that claims 1, 16, 18, 61-73, and 75 of U.S. Patent Application Serial No. 10/219,398 have been cancelled, and claims 2-15, 17, 19-40, 43, 46, 49-53, 80-83, and 85-88 have been withdrawn from consideration. Of the claims cited by the Examiner that are pending and under consideration in U.S. Patent Application Serial No. 10/219,398, (claims 41, 42, 44, 45, 47, 48, 54, 56-59, 79, and 84, of which claims 41, 44, 47, 54, and 84 are independent), each of the independent claims recites, *inter alia*, a composition in the form of a hardenable self-supporting structure having a first shape and sufficient malleability to be formed into a second shape. As discussed, *supra*, Appellants assert that although Neustadter et al. do describe the use of a plastic such as “polyvinyl acetate, polyethylene and copolymers thereof” (col. 2, lines 45-47), which may or may not be malleable, and the desire to select materials having a shore A hardness of about 70 (col. 2, lines 56-57), which may or may not be malleable, there is no specific and enabling disclosure of an organic composition that is itself self-supporting and malleable.

Furthermore, since Neustadter et al. describe dental patterns that include slot means for reshaping the pattern (e.g., col. 2, lines 11-16, “[t]he slot is relatively substantial width so that the width of the pattern can be narrowed sufficiently by pressing the edges together to partially or even fully close the slot the required amount to fit the prefabricated pattern into the space

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Filed: 19 August 2003

For: DENTAL ARTICLE FORMS AND METHODS

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between the sides of the abutting or adjacent teeth”), Appellants submit that Neustadter et al. show a form that requires a physical means, a slot, to change shape and it is not clear that reshaping ability of the Neustadter et al. dental patterns arises from the choice of materials for making the pattern (i.e., the selection of the plastic) or from the use of the slot means in the design of the pattern, particularly when the document is read as a whole.

For at least the foregoing reasons, Appellants assert that the Examiner has not overcome the requisite burden of proof in establishing a case of obviousness-type double patenting of claims 39 and 42-71 over claims 1-54, 56-73, 75, and 79-88 of U.S. Patent Application Serial No. 10/219,398 in view of Neustadter et al.

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VIII. SUMMARY

For the foregoing reasons, Appellant respectfully requests that the Board review and reverse the rejections of claims 39 and 42-71 as discussed herein and that notification of the allowance of these claims be issued.

Respectfully submitted by

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By: Dani Maoz
Name: Dani Maoz



CLAIMS APPENDIX

Serial No.: 10/643,748

Docket No.: 58614US002

Claims 1-71 are provided below.

1-38. (Cancelled)

39. (Rejected) A method of preparing a dental article, the method comprising:

selecting a dental article form having a self-supporting structure comprising a first shape that includes a reservoir, wherein the self-supporting structure is formed from an organic composition having sufficient malleability to be formed into a second shape, wherein the organic composition gives the self-supporting structure its self-supporting and malleable characteristics, and further wherein the organic composition is dimensionally stable and comprises a surfactant system mixed therein;

filling the reservoir with one or more hardenable dental materials;

placing the dental article form filled with one or more hardenable dental materials on a subject's tooth structure;

at least partially hardening the hardenable material to form the dental article;

optionally customizing the dental article outside of the subject's mouth;

cementing the dental article to the subject's tooth structure; and

removing the dental article form from the article;

wherein the dental article form is reshaped while in the subject's mouth ~~before or~~ after filling the reservoir with the hardenable dental material.

40-41. (Cancelled)

42. (Rejected) The method of claim 39 wherein the organic composition is curable.

43. (Rejected) The method of claim 42 wherein the curable organic composition comprises an initiator system and a resin system comprising at least one ethylenically unsaturated component.

44. (Rejected) The method of claim 39 wherein the organic composition is noncurable.

45. (Rejected) A method of preparing a dental article, the method comprising:

selecting a dental article form having a self-supporting structure comprising a first shape that includes a reservoir, wherein the self-supporting structure is formed from an organic composition having sufficient malleability to be formed into a second shape, wherein the organic composition gives the self-supporting structure its self-supporting and malleable characteristics;

filling the reservoir with one or more hardenable dental materials;

placing the dental article form filled with one or more hardenable dental materials on a subject's tooth structure;

at least partially hardening the hardenable material in the reservoir to form the dental article;

optionally customizing the dental article outside of the subject's mouth;

cementing the dental article to the subject's tooth structure; and

removing the dental article form from the dental article;

wherein the dental article form is reshaped while in the subject's mouth ~~before or~~ after filling the reservoir with the hardenable dental material.

46. (Rejected) The method of claim 45 wherein the dental article form is removed after the dental article is cemented to the subject's tooth structure.
47. (Rejected) The method of claim 45 wherein the dental article form comprises an organic composition comprising a surfactant system mixed therein.
48. (Rejected) The method of claim 45 wherein the organic composition comprises a filler system.
49. (Rejected) The method of claim 45 wherein the organic composition is free of added filler.
50. (Rejected) The method of claim 45 wherein the organic composition is curable or noncurable.

51. (Rejected) The method of claim 50 wherein the organic composition is curable.
52. (Rejected) The method of claim 51 wherein the curable organic composition comprises an initiator system and a resin system comprising at least one ethylenically unsaturated component.
53. (Rejected) The method of claim 50 wherein the organic composition is noncurable.
54. (Rejected) The method of claim 53 wherein the noncurable organic composition comprises a noncurable polymer selected from the group consisting of a polycaprolactone, a polyvinylacetate, and ethylene-vinyl acetate copolymer, a polyethylene glycol, a wax, and mixtures thereof.
55. (Rejected) The method of claim 45 wherein the dental article form is a form for a dental article selected from the group consisting of a crown, an inlay, an onlay, a bridge, an orthodontic appliance, a maxillofacial prosthesis, and a tooth splint.
56. (Rejected) The method of claim 45 wherein the dental article form is in packaging.
57. (Rejected) The method of claim 45 wherein the dental article form comprises one or more of the following features: a handle attached to the dental article form at a location

removed from the base of the dental article form; a vented handle through which excess amounts of hardenable dental material can pass during placement of the dental article form; and one or more lines of weakness that may be separated.

58. (Rejected) A method of preparing a dental article, the method comprising:

selecting a dental article form having a self-supporting structure comprising a first shape that includes a reservoir, wherein the self-supporting structure is formed from an organic composition having sufficient malleability to be formed into a second shape, wherein the organic composition gives the self-supporting structure its self-supporting and malleable characteristics;

filling the reservoir with one or more hardenable dental materials;

placing the dental article form filled with one or more hardenable dental materials on a subject's tooth structure;

hardening the hardenable material in the reservoir to form the dental article and cement it to the subject's tooth structure; and

removing the dental article form from the dental article;

wherein the dental article form is reshaped while in the subject's mouth ~~before or~~ after filling the reservoir with the hardenable dental material.

59. (Rejected) The method of claim 58 wherein the dental article form comprises an organic composition comprising a surfactant system mixed therein.

60. (Rejected) The method of claim 58 wherein the organic composition is curable or noncurable.
61. (Rejected) The method of claim 60 wherein the organic composition is curable.
62. (Rejected) The method of claim 61 wherein the curable organic composition comprises an initiator system and a resin system comprising at least one ethylenically unsaturated component.
63. (Rejected) The method of claim 60 wherein the organic composition is noncurable.
64. (Rejected) The method of claim 63 wherein the noncurable organic composition comprises a noncurable polymer selected from the group consisting of a polycaprolactone, a polyvinylacetate, and ethylene-vinyl acetate copolymer, a polyethylene glycol, a wax, and mixtures thereof.
65. (Rejected) A method of preparing a dental article, the method comprising:
- selecting a dental article form having a self-supporting structure comprising a first shape that includes a reservoir, wherein the self-supporting structure is formed from an organic composition having sufficient malleability to be formed into a second shape, wherein the dental article form does not include slots;
 - filling the reservoir with one or more hardenable dental materials;

placing the dental article form filled with one or more hardenable dental materials on a subject's tooth structure;

at least partially hardening the hardenable material in the reservoir to form the dental article;

optionally customizing the dental article outside of the subject's mouth;

cementing the dental article to the subject's tooth structure; and

removing the dental article form from the dental article;

wherein the dental article form is reshaped while in the subject's mouth ~~before or~~ after filling the reservoir with the hardenable dental material.

66. (Rejected) A method of preparing a dental article, the method comprising:

selecting a dental article form having a self-supporting structure comprising a first shape that includes a reservoir, wherein the self-supporting structure is formed from an organic composition having sufficient malleability to be formed into a second shape, wherein the dental article form does not include slots;

filling the reservoir with one or more hardenable dental materials;

placing the dental article form filled with one or more hardenable dental materials on a subject's tooth structure;

hardening the hardenable material in the reservoir to form the dental article and cement it to the subject's tooth structure; and

removing the dental article form from the dental article;

wherein the dental article form is reshaped while in the subject's mouth ~~before or~~ after

filling the reservoir with the hardenable dental material.

67. (Rejected) The method of claim 39 wherein the dental article formed, upon removal of the dental article form, is selected from the group consisting of a crown, an inlay, an onlay, a bridge, an orthodontic appliance, a maxillofacial prosthesis, and a tooth splint.
68. (Rejected) The method of claim 45 wherein the dental article formed, upon removal of the dental article form, is selected from the group consisting of a crown, an inlay, an onlay, a bridge, an orthodontic appliance, a maxillofacial prosthesis, and a tooth splint.
69. (Rejected) The method of claim 58 wherein the dental article formed, upon removal of the dental article form, is selected from the group consisting of a crown, an inlay, an onlay, a bridge, an orthodontic appliance, a maxillofacial prosthesis, and a tooth splint.
70. (Rejected) The method of claim 65 wherein the dental article formed, upon removal of the dental article form, is selected from the group consisting of a crown, an inlay, an onlay, a bridge, an orthodontic appliance, a maxillofacial prosthesis, and a tooth splint.
71. (Rejected) The method of claim 66 wherein the dental article formed, upon removal of the dental article form, is selected from the group consisting of a crown, an inlay, an onlay, a bridge, an orthodontic appliance, a maxillofacial prosthesis, and a tooth splint.

EVIDENCE APPENDIX

Serial No.: 10/643,748

Docket No.: 58614US002

1. Simor (U.S. Patent No. 3,585,723) (entered into the record by citation within the non-final Office Action mailed 23 February 2006).
2. Neustadter et al. (U.S. Patent No. 3,565,387) (entered into the record by citation within the non-final Office Action mailed 23 February 2006).
3. Ivanov et al. (U.S. Patent No. 4,113,499) (entered into the record by citation within the final Office Action mailed 27 June 2006).
4. Wilson (U.S. Patent No. 5,487,663) (entered into the record by citation within the non-final Office Action mailed 23 February 2006).
5. Uthoff (U.S. Patent No. 5,102,332) (entered into the record by citation within the non-final Office Action mailed 23 February 2006).
6. Kahn (U.S. Patent No. 3,949,476) (entered into the record by citation within the non-final Office Action mailed 23 February 2006).
7. M.P.E.P. §706.02(j), 8th Ed., Rev. 6 (Sept. 2007), page 700-48.
8. *KSR International Co. v. Teleflex, Inc.* 127 S.Ct 1727, 1676 L.Ed.2d 705, 82 USPQ.2d 1385 (2007).
9. *Ex parte Clapp*, 227 USPQ 972 (Bd. Pat. App. & Inter. 1985).
10. *In re Gorman*, 933 F.2d 982, 18 USPQ.2d 1885 (Fed. Cir. 1991).
11. *Princeton Biochemicals, Inc. v. Beckman Coulter, Inc.*, 411 F.3d 1332, 75 U.S.P.Q.2d 1051 (Fed. Cir. 2005).
12. *In re Rouffet*, 149 F.3d 1350, 47 USPQ.2d 1453 (Fed. Cir. 1998).
13. *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1, 148 USPQ 459 (1966).
14. *Monroe Auto Equipment Co. v. Heckethorn Mfg. & Supply Co.*, 332 F.2d 406, 141 USPQ 549 (6th Cir Tenn. 1964).

15. Response to non-final Office Action mailed 23 February 2006.
16. Response to final Office Action mailed 27 June 2006.
17. Response to Advisory Action mailed 16 October 2006.
18. Response to non-final Office Action mailed 5 December 2006.
19. Response to final Office Action mailed 11 May 2007.
20. Response to non-final Office Action mailed 24 October 2007.
21. Claims of co-pending U.S. Patent Application Serial No. 10/219,398.

RELATED PROCEEDINGS APPENDIX

Serial No.: 10/643,728

Docket No.: 58614US002

There are no appeals or interferences known to Appellant's Representatives which would directly affect, be directly affected by, or have a bearing on the Board's decision in the pending appeal.

See the Examiner Notes for form paragraph 7.12 to assist in the determination of the 35 U.S.C. 102(e) date of the reference.

3. Pre-AIPA 35 U.S.C. 102(e) (form paragraph 7.12.01) must be applied if the reference is a U.S. patent issued directly, or indirectly, from an international application filed prior to November 29, 2000. See the Examiner Notes for form paragraph 7.12.01 to assist in the determination of the 35 U.S.C. 102(e) date of the reference.

4. In determining the 35 U.S.C. 102(e) date, consider priority/benefit claims to earlier-filed U.S. provisional applications under 35 U.S.C. 119(e), U.S. nonprovisional applications under 35 U.S.C. 120 or 121, and international applications under 35 U.S.C. 120, 121 or 365(c) if the subject matter used to make the rejection is appropriately supported in the relied upon earlier-filed application's disclosure (and any intermediate application(s)). A benefit claim to a U.S. patent of an earlier-filed international application, which has an international filing date prior to November 29, 2000, may only result in an effective U.S. filing date as of the date the requirements of 35 U.S.C. 371(c)(1), (2) and (4) were fulfilled. Do NOT consider any priority/benefit claims to U.S. applications which are filed before an international application that has an international filing date prior to November 29, 2000. Do NOT consider foreign priority claims under 35 U.S.C. 119(a)-(d) and 365(a).

5. If the reference is a publication of an international application (including voluntary U.S. publication under 35 U.S.C. 122 of the national stage or a WIPO publication) that has an international filing date prior to November 29, 2000, did not designate the United States or was not published in English by WIPO, do not use this form paragraph. Such a reference is not a prior art reference under 35 U.S.C. 102(e). The reference may be applied under 35 U.S.C. 102(a) or (b) as of its publication date. See form paragraphs 7.08 and 7.09.

6. In bracket 2, insert either --clearly anticipated-- or --anticipated-- with an explanation at the end of the paragraph.

7. In bracket 3, insert the prior art relied upon.

8. This form paragraph must be preceded by either of form paragraphs 7.12 or 7.12.01.

9. Patent application publications may only be used if this form paragraph was preceded by form paragraph 7.12.

¶ 7.16 Rejection, 35 U.S.C. 102(b), Public Use or on Sale

Claim [1] rejected under 35 U.S.C. 102(b) based upon a public use or sale of the invention. [2]

Examiner Note:

1. This form paragraph must be preceded either by form paragraphs 7.07 and 7.09 or by form paragraph 7.103.

2. A full explanation of the evidence establishing a public use or sale must be provided in bracket 2.

¶ 7.17 Rejection, 35 U.S.C. 102(c), Abandonment of Invention

Claim [1] rejected under 35 U.S.C. 102(c) because the invention has been abandoned. [2]

Examiner Note:

1. This form paragraph must be preceded either by form paragraph 7.07 and 7.10 or by form paragraph 7.103.

2. In bracket 2, insert a full explanation of the evidence establishing abandonment of the invention. See MPEP § 2134.

¶ 7.18 Rejection, 35 U.S.C. 102(d), Foreign Patenting

Claim [1] rejected under 35 U.S.C. 102(d) as being barred by applicants [2].

[3]

Examiner Note:

1. This form paragraph must be preceded either by form paragraphs 7.07 and 7.11 or by form paragraph 7.103.

2. In bracket 3, insert an explanation of this rejection which must include appropriate dates and how they make the foreign patent available under 35 U.S.C. 102(d).

3. Refer to MPEP § 2135 for applicable 35 U.S.C. 102(d) prior art.

¶ 7.19 Rejection, 35 U.S.C. 102(f), Applicant Not the Inventor

Claim [1] rejected under 35 U.S.C. 102(f) because the applicant did not invent the claimed subject matter. [2]

Examiner Note:

1. This paragraph must be preceded either by paragraphs 7.07 and 7.13 or by paragraph 7.103.

2. In bracket 2, insert an explanation of the supporting evidence establishing that applicant was not the inventor. See MPEP § 2137.

706.02(j) Contents of a 35 U.S.C. 103 Rejection [R-6]

35 U.S.C. 103 authorizes a rejection where, to meet the claim, it is necessary to modify a single reference or to combine it with one or more other references. After indicating that the rejection is under 35 U.S.C. 103, the examiner should set forth in the Office action:

(A) the relevant teachings of the prior art relied upon, preferably with reference to the relevant column or page number(s) and line number(s) where appropriate,

(B) the difference or differences in the claim over the applied reference(s),

(C) the proposed modification of the applied reference(s) necessary to arrive at the claimed subject matter, and

(D) an explanation >as to< why >the claimed invention would have been obvious to< one of ordinary skill in the art at the time the invention was made**.

**

“To support the conclusion that the claimed invention is directed to obvious subject matter, either the references must expressly or impliedly suggest the claimed invention or the examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references.” *Ex parte Clapp*, 227 USPQ 972, 973 (Bd. Pat. App. & Inter. 1985). **

Where a reference is relied on to support a rejection, whether or not in a minor capacity, that reference should be positively included in the statement of the rejection. See *In re Hoch*, 428 F.2d 1341, 1342 n.3 166 USPQ 406, 407 n. 3 (CCPA 1970).

It is important for an examiner to properly communicate the basis for a rejection so that the issues can be identified early and the applicant can be given fair opportunity to reply. Furthermore, if an initially rejected application issues as a patent, the rationale behind an earlier rejection may be important in interpreting the scope of the patent claims. Since issued patents are presumed valid (35 U.S.C. 282) and constitute a property right (35 U.S.C. 261), the written record must be clear as to the basis for the grant. Since patent examiners cannot normally be compelled to testify in legal proceedings regarding their mental processes (see MPEP § 1701.01), it is important that the written record clearly explain the rationale for decisions made during prosecution of the application.

See MPEP § 2141 - § 2144.09 generally for guidance on patentability determinations under 35 U.S.C. 103, including a discussion of the requirements of *Graham v. John Deere*, 383 U.S. 1, 148 USPQ 459 (1966). See MPEP § 2145 for consideration of applicant's rebuttal arguments. See MPEP § 706.02(l) - § 706.02(l)(3) for a discussion of prior art disqualified under 35 U.S.C. 103(c).

706.02(k) Provisional Rejection (Obviousness) Under 35 U.S.C. *103 >Using Provisional Prior Art Under 35 U.S.C. 102(e)< [R-6]

Effective November 29, 1999, subject matter which was prior art under former 35 U.S.C. 103 via 35 U.S.C. 102(e) was disqualified as prior art against the claimed invention if that subject matter and the

claimed invention “were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person.” This amendment to 35 U.S.C. 103(c) was made pursuant to section 4807 of the American Inventors Protection Act of 1999 (AIPA); see Pub. L. 106-113, 113 Stat. 1501, 1501A-591 (1999). The changes to 35 U.S.C. 102(e) in the Intellectual Property and High Technology Technical Amendments Act of 2002 (Pub. L. 107-273, 116 Stat. 1758 (2002)) did not affect the exclusion under 35 U.S.C. 103(c) as amended on November 29, 1999. Subsequently, the Cooperative Research and Technology Enhancement Act of 2004 (CREATE Act) (Pub. L. 108-453, 118 Stat. 3596 (2004)) further amended 35 U.S.C. 103(c) to provide that subject matter developed by another person shall be treated as owned by the same person or subject to an obligation of assignment to the same person for purposes of determining obviousness if three conditions are met:

(A) the claimed invention was made by or on behalf of parties to a joint research agreement that was in effect on or before the date the claimed invention was made;

(B) the claimed invention was made as a result of activities undertaken within the scope of the joint research agreement; and

(C) the application for patent for the claimed invention discloses or is amended to disclose the names of the parties to the joint research agreement (hereinafter “joint research agreement disqualification”).

These changes to 35 U.S.C. 103(c) apply to all patents (including reissue patents) granted on or after December 10, 2004. The amendment to 35 U.S.C. 103(c) made by the AIPA to change “subsection (f) or (g)” to “one of more of subsections (e), (f), or (g)” applies to applications filed on or after November 29, 1999. It is to be noted that, for all applications (including reissue applications), if the application is pending on or after December 10, 2004, the 2004 changes to 35 U.S.C. 103(c), which effectively include the 1999 changes, apply; thus, the November 29, 1999 date of the prior revision to 35 U.S.C. 103(c) is no longer relevant.

In a reexamination proceeding, however, one must look at whether or not the patent being reexamined was granted on or after December 10, 2004 to determine whether 35 U.S.C. 103(c), as amended by



Source: USPQ, 2d Series (1986 - Present) > U.S. Supreme Court > KSR International Co. v. Teleflex Inc., 82 USPQ2d 1385 (U.S. 2007)

82 USPQ2d 1385
KSR International Co. v. Teleflex Inc.
U.S. Supreme Court

No. 04-1350

Decided April 30, 2007

127 S Ct 1727

167 LEd2d 705

Headnotes

PATENTS

[1] Patentability/Validity — Obviousness — Combining references (► 115.0905)

Rigid application of “teaching, suggestion, or motivation” test, under which patent claim is proved obvious only if prior art, nature of problem addressed by inventor, or knowledge of person having ordinary skill in art reveals some motivation or suggestion to combine prior art teachings, is inconsistent with expansive and flexible “functional approach” to resolution of obviousness issue, under which scope and content of prior art are determined, differences between prior art and claims at issue are ascertained, level of ordinary skill in pertinent art is resolved, and secondary considerations such as commercial success, long felt but unsolved needs, and failure of others may be considered if doing so would prove instructive; rigid TSM approach is therefore rejected.

[2] Patentability/Validity — Obviousness — Combining references (► 115.0905)

Patentability/Validity — Obviousness — Evidence of (► 115.0906)

Variations of particular work available in one field of endeavor may be prompted by design incentives and other market forces, either in same field or different one, and if person of ordinary skill in art can implement predictable variation, 35 U.S.C. §103 likely bars its patentability; similarly, if particular technique has been used to improve one device, and person of ordinary skill would recognize that it would improve similar devices in same way, then using that technique is obvious unless its actual application is beyond person's skill, and court resolving obviousness issue therefore must ask whether improvement is more than predictable use of prior art elements according to their established functions.

[3] Patentability/Validity — Obviousness — Combining references (► 115.0905)

Patentability/Validity — Obviousness — Evidence of (► 115.0906)

Court determining whether claimed combination of elements known in prior art would have been obvious will often be required to look to interrelated teachings of multiple patents, effects of demands known to design community or present in marketplace, and background knowledge of person of ordinary skill in art in order to determine whether there was apparent reason to combine known elements in manner claimed in patent in suit, and in order to facilitate review, this analysis should be made explicit; however, such analysis need not seek out precise teachings directed to specific subject matter of challenged claim, since court can take account of inferences and creative steps that person of ordinary skill in art would employ.

[4] Patentability/Validity — Obviousness — Combining references (► 115.0905)

Idea underlying “teaching, suggestion, or motivation” test, under which patent claim is proved obvious only if prior art, nature of problem addressed by inventor, or knowledge of person having ordinary skill in art reveals some motivation or suggestion to combine prior art teachings, is not necessarily inconsistent with expansive and flexible “functional approach” to resolution of obviousness issue, since TSM test is

based on helpful insights, namely, that patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in prior art, and that it can be important to identify reason that would have prompted person of ordinary skill in art to combine elements in manner claimed by new invention; however, it is error to apply TSM test as rigid and mandatory formula that limits obviousness analysis through formalistic conception of words "teaching," "suggestion," and "motivation," or by overemphasis on importance of published articles and explicit content of issued patents, since market demand, rather than scientific literature, often drives design trends, and granting patent protection to advances that would occur "in the ordinary course" without real innovation retards progress and may, in case of patents

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combining previously known elements, deprive prior inventions of their value or utility.

[5] Patentability/Validity — Obviousness — Combining references (► 115.0905)

Narrow conception of obviousness inquiry, reflected in appellate court's application of "teaching, suggestion, or motivation" test, resulted in erroneous conclusion that summary judgment of obviousness should be vacated, since decision was based on erroneous holding that courts and patent examiners should look only to problem that patentee was trying to solve, and on erroneous assumption that person of ordinary skill in art attempting to solve problem will be led only to those elements of prior art designed to solve same problem, since court erroneously concluded that patent claim cannot be proved obvious merely by showing that combination of elements was "obvious to try," and since appellate court drew wrong conclusion from risk of courts and patent examiners falling prey to "hindsight" bias, in that rigid application of preventative rules that deny fact finders recourse to common sense are neither necessary nor consistent with precedent.

[6] Patentability/Validity — Obviousness — Combining references (► 115.0905)

Patentability/Validity — Obviousness — Evidence of (► 115.0906)

Fact that claimed combination of elements was "obvious to try" might show that such combination was obvious under 35 U.S.C. §103, since, if there is design need or market pressure to solve problem, and there are finite number of identified, predictable solutions, person of ordinary skill in art has good reason to pursue known options within his or her technical grasp, and if this leads to anticipated success, it is likely product of ordinary skill and common sense, not innovation.

[7] Patentability/Validity — Obviousness — Relevant prior art — Particular inventions (► 115.0903.03)

Patentability/Validity — Obviousness — Combining references (► 115.0905)

Asserted claim of patent for position-adjustable vehicle pedal assembly having electronic pedal-position sensor attached to fixed pivot point is invalid as obvious over combination of prior art references, since prior art patent discloses support structure for adjustable pedal assembly in which one pivot point stays fixed, since, at relevant time, marketplace had created strong incentive to convert mechanical pedals to those employing electronic sensors, and pedal designer of ordinary skill would have seen benefit in upgrading device of prior patent with sensor required by new engines using computer-controlled throttles, since other prior art references taught utility of placing sensor on pedal's support structure rather than on footpad, and on nonmoving part of pedal structure, since most obvious nonmoving point on structure from which sensor can easily detect pedal position is fixed pivot point, and since designer seeking to avoid wire-chafing problems with electronic adjustable pedals would have known to employ adjustable pedal with fixed pivot disclosed by prior art patent; declaration submitted by patentees does not indicate that device of prior patent was so flawed that there was no reason to upgrade it to be compatible with modern engines, and patentees have shown no secondary considerations to dislodge obviousness determination.

[8] Patentability/Validity — Obviousness — Evidence of (► 115.0906)

JUDICIAL PRACTICE AND PROCEDURE

Procedure — Summary judgment — Patents (► 410.3303)

Procedure — Evidence — Expert testimony (► 410.3703)

Party's submission of conclusory expert affidavit addressing issue of obviousness in patent action does not preclude summary judgment, even though federal district court can and should take into account expert testimony, which may resolve or keep open certain questions of fact, since ultimate judgment of obviousness is legal determination; in present case, in which content of prior art, scope of asserted claim, and level of ordinary skill in art were not in material dispute, and obviousness of claim was apparent from these factors, summary judgment was appropriate, and nothing in declarations proffered by patentees prevented district court from reaching conclusions underlying its order for summary judgment of obviousness.

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Particular Patents

Particular patents — General and mechanical — Vehicle control pedal assembly

6,237,565, Engelgau, adjustable pedal assembly with electronic throttle control, invalid for obviousness.

Case History and Disposition

On writ of certiorari to the U.S. Court of Appeals for the Federal Circuit, Schall, J.

Action by Teleflex Inc. and Technology Holding Co. against KSR International Co. for patent infringement. The U.S. District Court for the Eastern District of Michigan granted summary judgment in favor of defendant on ground that patent in suit was invalid for obviousness, and plaintiffs appealed. Grant of summary judgment was vacated and remanded, and defendant-appellee filed petition for writ of certiorari. Reversed and remanded.

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Syllabus

Syllabus by the Court.

To control a conventional automobile's speed, the driver depresses or releases the gas pedal, which interacts with the throttle via a cable or other mechanical link. Because the pedal's position in the footwell normally cannot be adjusted, a driver wishing to be closer or farther from it must either reposition himself in the seat or move the seat, both of which can be imperfect solutions for smaller drivers in cars with deep footwells. This prompted inventors to design and patent pedals that could be adjusted to change their locations. The Asano patent reveals a support structure whereby, when the pedal location is adjusted, one of the pedal's pivot points stays fixed. Asano is also designed so that the force necessary to depress the pedal is the same regardless of location adjustments. The Redding patent reveals a different, sliding mechanism where both the pedal and the pivot point are adjusted.

In newer cars, computer-controlled throttles do not operate through force transferred from the pedal by a mechanical link, but open and close valves in response to electronic signals. For the computer to know what is happening with the pedal, an electronic sensor must translate the mechanical operation into digital data. Inventors had obtained a number of patents for such sensors. The so-called '936 patent taught that it was preferable to detect the pedal's position in the pedal mechanism, not in the engine, so the patent disclosed a pedal with an electronic sensor on a pivot point in the pedal assembly. The Smith patent taught that to prevent the wires connecting the sensor to the computer from chafing and wearing out, the sensor should be put on a fixed part of the pedal assembly rather than in or on the pedal's footpad. Inventors had also patented self-contained modular sensors, which can be taken off the shelf and attached to any mechanical pedal to allow it to function with a computer-controlled throttle. The '068 patent disclosed one such sensor. Chevrolet also manufactured trucks using modular sensors attached to the pedal support bracket, adjacent to the pedal and engaged with the pivot shaft about which the pedal rotates. Other patents disclose electronic sensors attached to adjustable pedal assemblies. For example, the Rixon patent locates the sensor in the pedal

footpad, but is known for wire chafing.

After petitioner KSR developed an adjustable pedal system for cars with cable-actuated throttles and obtained its '976 patent for the design, General Motors Corporation (GMC) chose KSR to supply adjustable pedal systems for trucks using computer-controlled throttles. To make the '976 pedal compatible with the trucks, KSR added a modular sensor to its design. Respondents (Teleflex) hold the exclusive license for the Engelgau patent, claim 4 of which discloses a position-adjustable pedal assembly with an electronic pedal position sensor attached at a fixed pivot point. Despite having denied a similar, broader claim, the

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U.S. Patent and Trademark Office (PTO) had allowed claim 4 because it included the limitation of a fixed pivot position, which distinguished the design from Redding's. Asano was neither included among the Engelgau patent's prior art references nor mentioned in the patent's prosecution, and the PTO did not have before it an adjustable pedal with a fixed pivot point. After learning of KSR's design for GMC, Teleflex sued for infringement, asserting that KSR's pedal system infringed the Engelgau patent's claim 4. KSR countered that claim 4 was invalid under §103 of the Patent Act, which forbids issuance of a patent when "the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art."

Graham v. John Deere Co. of Kansas City, 383 U.S. 1, 17–18 [148 USPQ 459], set out an objective analysis for applying §103: "[T]he scope and content of the prior art are ... determined; differences between the prior art and the claims at issue are ... ascertained; and the level of ordinary skill in the pertinent art resolved. Against this background the obviousness or nonobviousness of the subject matter is determined. Such secondary considerations as commercial success, long felt but unsolved needs, failure of others, etc., might be utilized to give light to the circumstances surrounding the origin of the subject matter sought to be patented." While the sequence of these questions might be reordered in any particular case, the factors define the controlling inquiry. However, seeking to resolve the obviousness question with more uniformity and consistency, the Federal Circuit has employed a "teaching, suggestion, or motivation" (TSM) test, under which a patent claim is only proved obvious if the prior art, the problem's nature, or the knowledge of a person having ordinary skill in the art reveals some motivation or suggestion to combine the prior art teachings.

The District Court granted KSR summary judgment. After reviewing pedal design history, the Engelgau patent's scope, and the relevant prior art, the court considered claim 4's validity, applying *Graham's* framework to determine whether under summary-judgment standards KSR had demonstrated that claim 4 was obvious. The court found "little difference" between the prior art's teachings and claim 4: Asano taught everything contained in the claim except using a sensor to detect the pedal's position and transmit it to a computer controlling the throttle. That additional aspect was revealed in, e.g., the '068 patent and Chevrolet's sensors. The court then held that KSR satisfied the TSM test, reasoning (1) the state of the industry would lead inevitably to combinations of electronic sensors and adjustable pedals, (2) Rixon provided the basis for these developments, and (3) Smith taught a solution to Rixon's chafing problems by positioning the sensor on the pedal's fixed structure, which could lead to the combination of a pedal like Asano with a pedal position sensor.

Reversing, the Federal Circuit ruled the District Court had not applied the TSM test strictly enough, having failed to make findings as to the specific understanding or principle within a skilled artisan's knowledge that would have motivated one with no knowledge of the invention to attach an electronic control to the Asano assembly's support bracket. The Court of Appeals held that the District Court's recourse to the nature of the problem to be solved was insufficient because, unless the prior art references addressed the precise problem that the patentee was trying to solve, the problem would not motivate an inventor to look at those references. The appeals court found that the Asano pedal was designed to ensure that the force required to depress the pedal is the same no matter how the pedal is adjusted, whereas Engelgau sought to provide a simpler, smaller, cheaper adjustable electronic pedal. The Rixon pedal, said the court, suffered from chafing but was not designed to solve that problem and taught nothing helpful to Engelgau's purpose. Smith, in turn, did not relate to adjustable pedals and did not necessarily go to the issue of motivation to attach the electronic control on the pedal assembly's support bracket. So interpreted, the court held, the patents would not have led a person of ordinary skill to put a sensor on an Asano-like pedal. That it might have been obvious to try that combination was likewise irrelevant. Finally, the court held that genuine issues of material fact precluded summary judgment.

Held: The Federal Circuit addressed the obviousness question in a narrow, rigid manner that is inconsistent with §103 and this Court's precedents. KSR provided convincing evidence that mounting an available sensor on a

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fixed pivot point of the Asano pedal was a design step well within the grasp of a person of ordinary skill in the relevant art and that the benefit of doing so would be obvious. Its arguments, and the record, demonstrate that the Engelgau patent's claim 4 is obvious. Pp. 11–24.

1. *Graham* provided an expansive and flexible approach to the obviousness question that is inconsistent with the way the Federal Circuit applied its TSM test here. Neither §103's enactment nor *Graham's* analysis disturbed the Court's earlier instructions concerning the need for caution in granting a patent based on the combination of elements found in the prior art. See *Great Atlantic & Pacific Tea Co. v. Supermarket Equipment Corp.*, 340 U.S. 147, 152 [87 USPQ 303]. Such a combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results. See, e.g., *United States v. Adams*, 383 U.S. 39, 50–52 [148 USPQ 479]. When a work is available in one field, design incentives and other market forces can prompt variations of it, either in the same field or in another. If a person of ordinary skill in the art can implement a predictable variation, and would see the benefit of doing so, §103 likely bars its patentability. Moreover, if a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond that person's skill. A court must ask whether the improvement is more than the predictable use of prior-art elements according to their established functions. Following these principles may be difficult if the claimed subject matter involves more than the simple substitution of one known element for another or the mere application of a known technique to a piece of prior art ready for the improvement. To determine whether there was an apparent reason to combine the known elements in the way a patent claims, it will often be necessary to look to interrelated teachings of multiple patents; to the effects of demands known to the design community or present in the marketplace; and to the background knowledge possessed by a person having ordinary skill in the art. To facilitate review, this analysis should be made explicit. But it need not seek out precise teachings directed to the challenged claim's specific subject matter, for a court can consider the inferences and creative steps a person of ordinary skill in the art would employ. Pp. 11–14.

(b) The TSM test captures a helpful insight: A patent composed of several elements is not proved obvious merely by demonstrating that each element was, independently, known in the prior art. Although common sense directs caution as to a patent application claiming as innovation the combination of two known devices according to their established functions, it can be important to identify a reason that would have prompted a person of ordinary skill in the art to combine the elements as the new invention does. Inventions usually rely upon building blocks long since uncovered, and claimed discoveries almost necessarily will be combinations of what, in some sense, is already known. Helpful insights, however, need not become rigid and mandatory formulas. If it is so applied, the TSM test is incompatible with this Court's precedents. The diversity of inventive pursuits and of modern technology counsels against confining the obviousness analysis by a formalistic conception of the words teaching, suggestion, and motivation, or by overemphasizing the importance of published articles and the explicit content of issued patents. In many fields there may be little discussion of obvious techniques or combinations, and market demand, rather than scientific literature, may often drive design trends. Granting patent protection to advances that would occur in the ordinary course without real innovation retards progress and may, for patents combining previously known elements, deprive prior inventions of their value or utility. Since the TSM test was devised, the Federal Circuit doubtless has applied it in accord with these principles in many cases. There is no necessary inconsistency between the test and the *Graham* analysis. But a court errs where, as here, it transforms general principle into a rigid rule limiting the obviousness inquiry. Pp. 14–15.

(c) The flaws in the Federal Circuit's analysis relate mostly to its narrow conception of the obviousness inquiry consequent in its application of the TSM test. The Circuit first erred in holding that courts and patent examiners should look only to the problem the patentee was trying to solve. Under the correct analysis, any need or problem known in the field and addressed by the patent can provide a reason for combining the elements in the

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manner claimed. Second, the appeals court erred in assuming that a person of ordinary skill in the art attempting to solve a problem will be led only to those prior art elements designed to solve the same problem. The court wrongly concluded that because Asano's primary purpose was solving the constant ratio problem, an inventor considering how to put a sensor on an adjustable pedal would have no reason to consider putting it on the Asano pedal. It is common sense that familiar items may have obvious uses beyond their primary purposes, and a person of ordinary skill often will be able to fit the teachings of multiple patents together like pieces of a puzzle. Regardless of Asano's primary purpose, it provided an obvious example of an adjustable pedal with a fixed pivot point, and the prior art was replete with patents indicating that such a point was an ideal mount for a sensor. Third, the court erred in concluding that a patent claim cannot be proved obvious

merely by showing that the combination of elements was obvious to try. When there is a design need or market pressure to solve a problem and there are a finite number of identified, predictable solutions, a person of ordinary skill in the art has good reason to pursue the known options within his or her technical grasp. If this leads to the anticipated success, it is likely the product not of innovation but of ordinary skill and common sense. Finally, the court drew the wrong conclusion from the risk of courts and patent examiners falling prey to hindsight bias. Rigid preventative rules that deny recourse to common sense are neither necessary under, nor consistent with, this Court's case law. Pp. 15–18.

2. Application of the foregoing standards demonstrates that claim 4 is obvious. Pp. 18–23.

(a) The Court rejects Teleflex's argument that the Asano pivot mechanism's design prevents its combination with a sensor in the manner claim 4 describes. This argument was not raised before the District Court, and it is unclear whether it was raised before the Federal Circuit. Given the significance of the District Court's finding that combining Asano with a pivot-mounted pedal position sensor fell within claim 4's scope, it is apparent that Teleflex would have made clearer challenges if it intended to preserve this claim. Its failure to clearly raise the argument, and the appeals court's silence on the issue, lead this Court to accept the District Court's conclusion. Pp. 18–20.

(b) The District Court correctly concluded that when Engelgau designed the claim 4 subject matter, it was obvious to a person of ordinary skill in the art to combine Asano with a pivot-mounted pedal position sensor. There then was a marketplace creating a strong incentive to convert mechanical pedals to electronic pedals, and the prior art taught a number of methods for doing so. The Federal Circuit considered the issue too narrowly by, in effect, asking whether a pedal designer writing on a blank slate would have chosen both Asano and a modular sensor similar to the ones used in the Chevrolet trucks and disclosed in the '068 patent. The proper question was whether a pedal designer of ordinary skill in the art, facing the wide range of needs created by developments in the field, would have seen an obvious benefit to upgrading Asano with a sensor. For such a designer starting with Asano, the question was where to attach the sensor. The '936 patent taught the utility of putting the sensor on the pedal device. Smith, in turn, explained not to put the sensor on the pedal footpad, but instead on the structure. And from Rixon's known wire-chafing problems, and Smith's teaching that the pedal assemblies must not precipitate any motion in the connecting wires, the designer would know to place the sensor on a nonmoving part of the pedal structure. The most obvious such point is a pivot point. The designer, accordingly, would follow Smith in mounting the sensor there. Just as it was possible to begin with the objective to upgrade Asano to work with a computer-controlled throttle, so too was it possible to take an adjustable electronic pedal like Rixon and seek an improvement that would avoid the wire-chafing problem. Teleflex has not shown anything in the prior art that taught away from the use of Asano, nor any secondary factors to dislodge the determination that claim 4 is obvious. Pp. 20–23.

3. The Court disagrees with the Federal Circuit's holding that genuine issues of material fact precluded summary judgment. The ultimate judgment of obviousness is a legal determination. *Graham*, 383 U.S., at 17. Where, as here, the prior art's content, the patent claim's scope, and the level of ordinary skill in the art are not in material dispute and the claim's obviousness

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is apparent, summary judgment is appropriate. P. 23.

119 Fed. Appx. 282, reversed and remanded.

Kennedy, J., delivered the opinion for a unanimous Court.

Opinion Text

Opinion By:

Kennedy, J.

Teleflex Incorporated and its subsidiary Technology Holding Company—both referred to here as Teleflex—sued KSR International Company for patent infringement. The patent at issue, United States Patent No. 6,237,565 B1, is entitled “Adjustable Pedal Assembly With Electronic Throttle Control.” Supplemental App. 1. The patentee is Steven J. Engelgau, and the patent is referred to as “the Engelgau patent.” Teleflex holds the exclusive license to the patent.

Claim 4 of the Engelgau patent describes a mechanism for combining an electronic sensor with an adjustable automobile pedal so the pedal's position can be transmitted to a computer that controls the throttle in the vehicle's engine. When Teleflex accused KSR of infringing the Engelgau patent by adding an electronic sensor to one of KSR's previously designed pedals, KSR countered that claim 4 was invalid under the Patent Act, 35

U.S.C. §103, because its subject matter was obvious.

Section 103 forbids issuance of a patent when “the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.”

In *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1 [148 USPQ 459] (1966), the Court set out a framework for applying the statutory language of §103, language itself based on the logic of the earlier decision in *Hotchkiss v. Greenwood*, 11 How. 248 (1851), and its progeny. See 383 U.S., at 15–17. The analysis is objective:

“Under §103, the scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved. Against this background the obviousness or nonobviousness of the subject matter is determined. Such secondary considerations as commercial success, long felt but unsolved needs, failure of others, etc., might be utilized to give light to the circumstances surrounding the origin of the subject matter sought to be patented.” *Id.*, at 17–18.

While the sequence of these questions might be reordered in any particular case, the factors continue to define the inquiry that controls. If a court, or patent examiner, conducts this analysis and concludes the claimed subject matter was obvious, the claim is invalid under §103.

Seeking to resolve the question of obviousness with more uniformity and consistency, the Court of Appeals for the Federal Circuit has employed an approach referred to by the parties as the “teaching, suggestion, or motivation” test (TSM test), under which a patent claim is only proved obvious if “some motivation or suggestion to combine the prior art teachings” can be found in the prior art, the nature of the problem, or the knowledge of a person having ordinary skill in the art. See, e.g., *Al-Site Corp. v. VSI Int'l, Inc.*, 174 F.3d 1308, 1323–1324 [50 USPQ2d 1161] (CA Fed. 1999). KSR challenges that test, or at least its application in this case. See 119 Fed. Appx. 282, 286–290 (CA Fed. 2005). Because the Court of Appeals addressed the question of obviousness in a manner contrary to §103 and our precedents, we granted certiorari, 547 U.S. ____ (2006). We now reverse.

I

A

In car engines without computer-controlled throttles, the accelerator pedal interacts with the throttle via cable or other mechanical link. The pedal arm acts as a lever rotating around a pivot point. In a cable-actuated throttle control the rotation caused by pushing down the pedal pulls a cable, which in turn pulls open valves in the carburetor or fuel injection unit. The wider the valves open, the more fuel and air are released, causing combustion to increase and the car to accelerate. When the driver takes his foot off the pedal, the opposite occurs as the cable is released and the valves slide closed.

In the 1990's it became more common to install computers in cars to control engine operation. Computer-controlled throttles open and close valves in response to electronic signals, not through force transferred from the pedal by a mechanical link. Constant, delicate

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adjustments of air and fuel mixture are possible. The computer's rapid processing of factors beyond the pedal's position improves fuel efficiency and engine performance.

For a computer-controlled throttle to respond to a driver's operation of the car, the computer must know what is happening with the pedal. A cable or mechanical link does not suffice for this purpose; at some point, an electronic sensor is necessary to translate the mechanical operation into digital data the computer can understand.

Before discussing sensors further we turn to the mechanical design of the pedal itself. In the traditional design a pedal can be pushed down or released but cannot have its position in the footwell adjusted by sliding the pedal forward or back. As a result, a driver who wishes to be closer or farther from the pedal must either reposition himself in the driver's seat or move the seat in some way. In cars with deep footwells these are imperfect solutions for drivers of smaller stature. To solve the problem, inventors, beginning in the 1970's, designed pedals that could be adjusted to change their location in the footwell. Important for this case are two adjustable pedals disclosed in U.S. Patent Nos. 5,010,782 (filed July 28, 1989) (Asano) and 5,460,061 (filed Sept. 17, 1993) (Redding). The Asano patent reveals a support structure that houses the pedal so that even

when the pedal location is adjusted relative to the driver, one of the pedal's pivot points stays fixed. The pedal is also designed so that the force necessary to push the pedal down is the same regardless of adjustments to its location. The Redding patent reveals a different, sliding mechanism where both the pedal and the pivot point are adjusted.

We return to sensors. Well before Engelgau applied for his challenged patent, some inventors had obtained patents involving electronic pedal sensors for computer-controlled throttles. These inventions, such as the device disclosed in U.S. Patent No. 5,241,936 (filed Sept. 9, 1991) ('936), taught that it was preferable to detect the pedal's position in the pedal assembly, not in the engine. The '936 patent disclosed a pedal with an electronic sensor on a pivot point in the pedal assembly. U.S. Patent No. 5,063,811 (filed July 9, 1990) (Smith) taught that to prevent the wires connecting the sensor to the computer from chafing and wearing out, and to avoid grime and damage from the driver's foot, the sensor should be put on a fixed part of the pedal assembly rather than in or on the pedal's footpad.

In addition to patents for pedals with integrated sensors inventors obtained patents for self-contained modular sensors. A modular sensor is designed independently of a given pedal so that it can be taken off the shelf and attached to mechanical pedals of various sorts, enabling the pedals to be used in automobiles with computer-controlled throttles. One such sensor was disclosed in U.S. Patent No. 5,385,068 (filed Dec. 18, 1992) ('068). In 1994, Chevrolet manufactured a line of trucks using modular sensors "attached to the pedal support bracket, adjacent to the pedal and engaged with the pivot shaft about which the pedal rotates in operation." 298 F.Supp.2d 581, 589 (E.D. Mich. 2003).

The prior art contained patents involving the placement of sensors on adjustable pedals as well. For example, U.S. Patent No. 5,819,593 (filed Aug. 17, 1995) (Rixon) discloses an adjustable pedal assembly with an electronic sensor for detecting the pedal's position. In the Rixon pedal the sensor is located in the pedal footpad. The Rixon pedal was known to suffer from wire chafing when the pedal was depressed and released.

This short account of pedal and sensor technology leads to the instant case.

B

KSR, a Canadian company, manufactures and supplies auto parts, including pedal systems. Ford Motor Company hired KSR in 1998 to supply an adjustable pedal system for various lines of automobiles with cable-actuated throttle controls. KSR developed an adjustable mechanical pedal for Ford and obtained U.S. Patent No. 6,151,976 (filed July 16, 1999) ('976) for the design. In 2000, KSR was chosen by General Motors Corporation (GMC or GM) to supply adjustable pedal systems for Chevrolet and GMC light trucks that used engines with computer-controlled throttles. To make the '976 pedal compatible with the trucks, KSR merely took that design and added a modular sensor.

Teleflex is a rival to KSR in the design and manufacture of adjustable pedals. As noted, it is the exclusive licensee of the Engelgau patent. Engelgau filed the patent application on August 22, 2000 as a continuation of a previous

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application for U.S. Patent No. 6,109,241, which was filed on January 26, 1999. He has sworn he invented the patent's subject matter on February 14, 1998. The Engelgau patent discloses an adjustable electronic pedal described in the specification as a "simplified vehicle control pedal assembly that is less expensive, and which uses fewer parts and is easier to package within the vehicle." Engelgau, col. 2, lines 2-5, Supplemental App. 6. Claim 4 of the patent, at issue here, describes:

"A vehicle control pedal apparatus comprising:
 a support adapted to be mounted to a vehicle structure;
 an adjustable pedal assembly having a pedal arm moveable in fore and aft directions with respect to said support;
 a pivot for pivotally supporting said adjustable pedal assembly with respect to said support and defining a pivot axis; and
 an electronic control attached to said support for controlling a vehicle system;
 said apparatus characterized by said electronic control being responsive to said pivot for providing a signal that corresponds to pedal arm position as said pedal arm pivots about said pivot axis between rest and applied positions wherein the position of said pivot remains constant while said pedal arm moves in fore and aft directions with respect to said pivot." *Id.*, col. 6, lines 17-36, Supplemental App. 8 (diagram numbers omitted).

We agree with the District Court that the claim discloses "a position-adjustable pedal assembly with an electronic pedal position sensor attached to the support member of the pedal assembly. Attaching the sensor to the support member allows the sensor to remain in a fixed position while the driver adjusts the pedal." 298 F.Supp.2d, at 586-587.

Before issuing the Engelgau patent the U.S. Patent and Trademark Office (PTO) rejected one of the patent claims that was similar to, but broader than, the present claim 4. The claim did not include the requirement that the sensor be placed on a fixed pivot point. The PTO concluded the claim was an obvious combination of the prior art disclosed in Redding and Smith, explaining:

" 'Since the prior ar[t] references are from the field of endeavor, the purpose disclosed ... would have been recognized in the pertinent art of Redding. Therefore it would have been obvious ... to provide the device of Redding with the ... means attached to a support member as taught by Smith.' " *Id.*, at 595.

In other words Redding provided an example of an adjustable pedal and Smith explained how to mount a sensor on a pedal's support structure, and the rejected patent claim merely put these two teachings together.

Although the broader claim was rejected, claim 4 was later allowed because it included the limitation of a fixed pivot point, which distinguished the design from Redding's. *Ibid.* Engelgau had not included Asano among the prior art references, and Asano was not mentioned in the patent's prosecution. Thus, the PTO did not have before it an adjustable pedal with a fixed pivot point. The patent issued on May 29, 2001 and was assigned to Teleflex.

Upon learning of KSR's design for GM, Teleflex sent a warning letter informing KSR that its proposal would violate the Engelgau patent. " 'Teleflex believes that any supplier of a product that combines an adjustable pedal with an electronic throttle control necessarily employs technology covered by one or more' " of Teleflex's patents. *Id.*, at 585. KSR refused to enter a royalty arrangement with Teleflex; so Teleflex sued for infringement, asserting KSR's pedal infringed the Engelgau patent and two other patents. *Ibid.* Teleflex later abandoned its claims regarding the other patents and dedicated the patents to the public. The remaining contention was that KSR's pedal system for GM infringed claim 4 of the Engelgau patent. Teleflex has not argued that the other three claims of the patent are infringed by KSR's pedal, nor has Teleflex argued that the mechanical adjustable pedal designed by KSR for Ford infringed any of its patents.

C

The District Court granted summary judgment in KSR's favor. After reviewing the pertinent history of pedal design, the scope of the Engelgau patent, and the relevant prior art, the court considered the validity of the contested claim. By direction of 35 U.S.C. §282, an issued patent is presumed valid. The District Court applied *Graham's* framework to determine

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whether under summary-judgment standards KSR had overcome the presumption and demonstrated that claim 4 was obvious in light of the prior art in existence when the claimed subject matter was invented. See §102(a).

The District Court determined, in light of the expert testimony and the parties' stipulations, that the level of ordinary skill in pedal design was " 'an undergraduate degree in mechanical engineering (or an equivalent amount of industry experience) [and] familiarity with pedal control systems for vehicles.' " 298 F.Supp.2d, at 590. The court then set forth the relevant prior art, including the patents and pedal designs described above.

Following *Graham's* direction, the court compared the teachings of the prior art to the claims of Engelgau. It found "little difference." 298 F.Supp.2d, at 590. Asano taught everything contained in claim 4 except the use of a sensor to detect the pedal's position and transmit it to the computer controlling the throttle. That additional aspect was revealed in sources such as the '068 patent and the sensors used by Chevrolet.

Under the controlling cases from the Court of Appeals for the Federal Circuit, however, the District Court was not permitted to stop there. The court was required also to apply the TSM test. The District Court held KSR had satisfied the test. It reasoned (1) the state of the industry would lead inevitably to combinations of electronic sensors and adjustable pedals, (2) Rixon provided the basis for these developments, and (3) Smith taught a solution to the wire chafing problems in Rixon, namely locating the sensor on the fixed structure of the pedal. This could lead to the combination of Asano, or a pedal like it, with a pedal position sensor.

The conclusion that the Engelgau design was obvious was supported, in the District Court's view, by the PTO's rejection of the broader version of claim 4. Had Engelgau included Asano in his patent application, it reasoned,

the PTO would have found claim 4 to be an obvious combination of Asano and Smith, as it had found the broader version an obvious combination of Redding and Smith. As a final matter, the District Court held that the secondary factor of Teleflex's commercial success with pedals based on Engelgau's design did not alter its conclusion. The District Court granted summary judgment for KSR.

With principal reliance on the TSM test, the Court of Appeals reversed. It ruled the District Court had not been strict enough in applying the test, having failed to make " 'finding[s] as to the specific understanding or principle within the knowledge of a skilled artisan that would have motivated one with no knowledge of [the] invention' ... to attach an electronic control to the support bracket of the Asano assembly." 119 Fed. Appx., at 288 (brackets in original) (quoting *In re Kotzab*, 217 F.3d 1365, 1371 [55 USPQ2d 1313] (CA Fed. 2000)). The Court of Appeals held that the District Court was incorrect that the nature of the problem to be solved satisfied this requirement because unless the "prior art references address[ed] the precise problem that the patentee was trying to solve," the problem would not motivate an inventor to look at those references. 119 Fed. Appx., at 288.

Here, the Court of Appeals found, the Asano pedal was designed to solve the " 'constant ratio problem' "—that is, to ensure that the force required to depress the pedal is the same no matter how the pedal is adjusted—whereas Engelgau sought to provide a simpler, smaller, cheaper adjustable electronic pedal. *Ibid.* As for Rixon, the court explained, that pedal suffered from the problem of wire chafing but was not designed to solve it. In the court's view Rixon did not teach anything helpful to Engelgau's purpose. Smith, in turn, did not relate to adjustable pedals and did not "necessarily go to the issue of motivation to attach the electronic control on the support bracket of the pedal assembly." *Ibid.* When the patents were interpreted in this way, the Court of Appeals held, they would not have led a person of ordinary skill to put a sensor on the sort of pedal described in Asano.

That it might have been obvious to try the combination of Asano and a sensor was likewise irrelevant, in the court's view, because " '[o]bvious to try' has long been held not to constitute obviousness.' " *Id.*, at 289 (quoting *In re Deuel*, 51 F.3d 1552, 1559 [34 USPQ2d 1210] (CA Fed. 1995)).

The Court of Appeals also faulted the District Court's consideration of the PTO's rejection of the broader version of claim 4. The District Court's role, the Court of Appeals explained, was not to speculate regarding what the PTO might have done had the Engelgau patent mentioned Asano. Rather, the court held, the District Court was obliged first to

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presume that the issued patent was valid and then to render its own independent judgment of obviousness based on a review of the prior art. The fact that the PTO had rejected the broader version of claim 4, the Court of Appeals said, had no place in that analysis.

The Court of Appeals further held that genuine issues of material fact precluded summary judgment. Teleflex had proffered statements from one expert that claim 4 " 'was a simple, elegant, and novel combination of features,' " 119 Fed. Appx., at 290, compared to Rixon, and from another expert that claim 4 was nonobvious because, unlike in Rixon, the sensor was mounted on the support bracket rather than the pedal itself. This evidence, the court concluded, sufficed to require a trial.

II

A

[1] We begin by rejecting the rigid approach of the Court of Appeals. Throughout this Court's engagement with the question of obviousness, our cases have set forth an expansive and flexible approach inconsistent with the way the Court of Appeals applied its TSM test here. To be sure, *Graham* recognized the need for "uniformity and definiteness." 383 U.S., at 18. Yet the principles laid down in *Graham* reaffirmed the "functional approach" of *Hotchkiss*, 11 How. 248. See 383 U.S., at 12. To this end, *Graham* set forth a broad inquiry and invited courts, where appropriate, to look at any secondary considerations that would prove instructive. *Id.*, at 17.

Neither the enactment of §103 nor the analysis in *Graham* disturbed this Court's earlier instructions concerning the need for caution in granting a patent based on the combination of elements found in the prior art. For over a half century, the Court has held that a "patent for a combination which only unites old elements with no change in their respective functions ... obviously withdraws what is already known into the field of its monopoly and diminishes the resources available to skillful men." *Great Atlantic & Pacific Tea Co. v. Supermarket Equipment Corp.*, 340 U.S. 147, 152 [87 USPQ 303] (1950). This is a principal reason for declining to allow patents for what is obvious. The combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results. Three cases decided after

Graham illustrate the application of this doctrine.

In *United States v. Adams*, 383 U.S. 39, 40 [148 USPQ 479] (1966), a companion case to *Graham*, the Court considered the obviousness of a "wet battery" that varied from prior designs in two ways: It contained water, rather than the acids conventionally employed in storage batteries; and its electrodes were magnesium and cuprous chloride, rather than zinc and silver chloride. The Court recognized that when a patent claims a structure already known in the prior art that is altered by the mere substitution of one element for another known in the field, the combination must do more than yield a predictable result. 383 U.S., at 50–51. It nevertheless rejected the Government's claim that Adams's battery was obvious. The Court relied upon the corollary principle that when the prior art teaches away from combining certain known elements, discovery of a successful means of combining them is more likely to be nonobvious. *Id.*, at 51–52. When Adams designed his battery, the prior art warned that risks were involved in using the types of electrodes he employed. The fact that the elements worked together in an unexpected and fruitful manner supported the conclusion that Adams's design was not obvious to those skilled in the art.

In *Anderson's-Black Rock, Inc. v. Pavement Salvage Co.*, 396 U.S. 57 [163 USPQ 673] (1969), the Court elaborated on this approach. The subject matter of the patent before the Court was a device combining two pre-existing elements: a radiant-heat burner and a paving machine. The device, the Court concluded, did not create some new synergy: The radiant-heat burner functioned just as a burner was expected to function; and the paving machine did the same. The two in combination did no more than they would in separate, sequential operation. *Id.*, at 60–62. In those circumstances, "while the combination of old elements performed a useful function, it added nothing to the nature and quality of the radiant-heat burner already patented," and the patent failed under §103. *Id.*, at 62 (footnote omitted).

Finally, in *Sakraida v. AG Pro, Inc.*, 425 U.S. 273 [189 USPQ 449] (1976), the Court derived from the precedents the conclusion that when a patent "simply arranges old elements with each performing the same function it had been known to perform" and yields no

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more than one would expect from such an arrangement, the combination is obvious. *Id.*, at 282.

[2] The principles underlying these cases are instructive when the question is whether a patent claiming the combination of elements of prior art is obvious. When a work is available in one field of endeavor, design incentives and other market forces can prompt variations of it, either in the same field or a different one. If a person of ordinary skill can implement a predictable variation, §103 likely bars its patentability. For the same reason, if a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill. *Sakraida* and *Anderson's-Black Rock* are illustrative—a court must ask whether the improvement is more than the predictable use of prior art elements according to their established functions.

[3] Following these principles may be more difficult in other cases than it is here because the claimed subject matter may involve more than the simple substitution of one known element for another or the mere application of a known technique to a piece of prior art ready for the improvement. Often, it will be necessary for a court to look to interrelated teachings of multiple patents; the effects of demands known to the design community or present in the marketplace; and the background knowledge possessed by a person having ordinary skill in the art, all in order to determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue. To facilitate review, this analysis should be made explicit. See *In re Kahn*, 441 F.3d 977, 988 [78 USPQ2d 1329] (CA Fed. 2006) ("[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness"). As our precedents make clear, however, the analysis need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ.

B

[4] When it first established the requirement of demonstrating a teaching, suggestion, or motivation to combine known elements in order to show that the combination is obvious, the Court of Customs and Patent Appeals captured a helpful insight. See *Application of Bergel*, 292 F.2d 955, 956–957 [130 USPQ 206] (1961). As is clear from cases such as *Adams*, a patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art. Although common sense directs one to look with care at a patent application that claims as innovation the combination of two known devices according to their established functions, it can be important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new

invention does. This is so because inventions in most, if not all, instances rely upon building blocks long since uncovered, and claimed discoveries almost of necessity will be combinations of what, in some sense, is already known.

Helpful insights, however, need not become rigid and mandatory formulas; and when it is so applied, the TSM test is incompatible with our precedents. The obviousness analysis cannot be confined by a formalistic conception of the words teaching, suggestion, and motivation, or by overemphasis on the importance of published articles and the explicit content of issued patents. The diversity of inventive pursuits and of modern technology counsels against limiting the analysis in this way. In many fields it may be that there is little discussion of obvious techniques or combinations, and it often may be the case that market demand, rather than scientific literature, will drive design trends. Granting patent protection to advances that would occur in the ordinary course without real innovation retards progress and may, in the case of patents combining previously known elements, deprive prior inventions of their value or utility.

In the years since the Court of Customs and Patent Appeals set forth the essence of the TSM test, the Court of Appeals no doubt has applied the test in accord with these principles in many cases. There is no necessary inconsistency between the idea underlying the TSM test and the *Graham* analysis. But when a court transforms the general principle into a

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rigid rule that limits the obviousness inquiry, as the Court of Appeals did here, it errs.

C

The flaws in the analysis of the Court of Appeals relate for the most part to the court's narrow conception of the obviousness inquiry reflected in its application of the TSM test. In determining whether the subject matter of a patent claim is obvious, neither the particular motivation nor the avowed purpose of the patentee controls. What matters is the objective reach of the claim. If the claim extends to what is obvious, it is invalid under §103. One of the ways in which a patent's subject matter can be proved obvious is by noting that there existed at the time of invention a known problem for which there was an obvious solution encompassed by the patent's claims.

[5] The first error of the Court of Appeals in this case was to foreclose this reasoning by holding that courts and patent examiners should look only to the problem the patentee was trying to solve. 119 Fed. Appx., at 288. The Court of Appeals failed to recognize that the problem motivating the patentee may be only one of many addressed by the patent's subject matter. The question is not whether the combination was obvious to the patentee but whether the combination was obvious to a person with ordinary skill in the art. Under the correct analysis, any need or problem known in the field of endeavor at the time of invention and addressed by the patent can provide a reason for combining the elements in the manner claimed.

The second error of the Court of Appeals lay in its assumption that a person of ordinary skill attempting to solve a problem will be led only to those elements of prior art designed to solve the same problem. *Ibid.* The primary purpose of Asano was solving the constant ratio problem; so, the court concluded, an inventor considering how to put a sensor on an adjustable pedal would have no reason to consider putting it on the Asano pedal. *Ibid.* Common sense teaches, however, that familiar items may have obvious uses beyond their primary purposes, and in many cases a person of ordinary skill will be able to fit the teachings of multiple patents together like pieces of a puzzle. Regardless of Asano's primary purpose, the design provided an obvious example of an adjustable pedal with a fixed pivot point; and the prior art was replete with patents indicating that a fixed pivot point was an ideal mount for a sensor. The idea that a designer hoping to make an adjustable electronic pedal would ignore Asano because Asano was designed to solve the constant ratio problem makes little sense. A person of ordinary skill is also a person of ordinary creativity, not an automaton.

[6] The same constricted analysis led the Court of Appeals to conclude, in error, that a patent claim cannot be proved obvious merely by showing that the combination of elements was "obvious to try." *Id.*, at 289 (internal quotation marks omitted). When there is a design need or market pressure to solve a problem and there are a finite number of identified, predictable solutions, a person of ordinary skill has good reason to pursue the known options within his or her technical grasp. If this leads to the anticipated success, it is likely the product not of innovation but of ordinary skill and common sense. In that instance the fact that a combination was obvious to try might show that it was obvious under §103.

The Court of Appeals, finally, drew the wrong conclusion from the risk of courts and patent examiners falling prey to hindsight bias. A factfinder should be aware, of course, of the distortion caused by hindsight bias and must be cautious of arguments reliant upon *ex post* reasoning. See *Graham*, 383 U.S., at 36 (warning against a "temptation to read into the prior art the teachings of the invention in issue" and instructing courts to "guard against slipping into the use of hindsight" (quoting *Monroe Auto Equipment Co. v. Heckethorn Mfg. &*

Supply Co., 332 F.2d 406, 412 [141 USPQ 549] (CA6 1964))). Rigid preventative rules that deny factfinders recourse to common sense, however, are neither necessary under our case law nor consistent with it.

We note the Court of Appeals has since elaborated a broader conception of the TSM test than was applied in the instant matter. See, e.g., *DyStar Textilfarben GmbH & Co. Deutschland KG v. C. H. Patrick Co.*, 464 F.3d 1356, 1367 [80 USPQ2d 1641] (2006) ("Our suggestion test is in actuality quite flexible and not only permits, but *requires*, consideration of common knowledge and common sense"); *Alza Corp. v. Mylan Labs., Inc.*, 464 F.3d 1286, 1291 [80 USPQ2d 1001] (2006) ("There is flexibility in our obviousness jurisprudence because a motivation may be found *implicitly* in the prior art. We do not

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have a rigid test that requires an actual teaching to combine ..."). Those decisions, of course, are not now before us and do not correct the errors of law made by the Court of Appeals in this case. The extent to which they may describe an analysis more consistent with our earlier precedents and our decision here is a matter for the Court of Appeals to consider in its future cases. What we hold is that the fundamental misunderstandings identified above led the Court of Appeals in this case to apply a test inconsistent with our patent law decisions.

III

When we apply the standards we have explained to the instant facts, claim 4 must be found obvious. We agree with and adopt the District Court's recitation of the relevant prior art and its determination of the level of ordinary skill in the field. As did the District Court, we see little difference between the teachings of Asano and Smith and the adjustable electronic pedal disclosed in claim 4 of the Engelgau patent. A person having ordinary skill in the art could have combined Asano with a pedal position sensor in a fashion encompassed by claim 4, and would have seen the benefits of doing so.

A

Teleflex argues in passing that the Asano pedal cannot be combined with a sensor in the manner described by claim 4 because of the design of Asano's pivot mechanisms. See Brief for Respondents 48–49, and n. 17. Therefore, Teleflex reasons, even if adding a sensor to Asano was obvious, that does not establish that claim 4 encompasses obvious subject matter. This argument was not, however, raised before the District Court. There Teleflex was content to assert only that the problem motivating the invention claimed by the Engelgau patent would not lead to the solution of combining of Asano with a sensor. See Teleflex's Response to KSR's Motion for Summary Judgment of Invalidity in No. 02–74586 (ED Mich.), pp. 18–20, App. 144a–146a. It is also unclear whether the current argument was raised before the Court of Appeals, where Teleflex advanced the nonspecific, conclusory contention that combining Asano with a sensor would not satisfy the limitations of claim 4. See Brief for Plaintiffs-Appellants in No. 04–1152 (CA Fed.), pp. 42–44. Teleflex's own expert declarations, moreover, do not support the point Teleflex now raises. See Declaration of Clark J. Radcliffe, Ph.D., Supplemental App. 204–207; Declaration of Timothy L. Andresen, *id.*, at 208–210. The only statement in either declaration that might bear on the argument is found in the Radcliffe declaration:

"Asano ... and Rixon ... are complex mechanical linkage-based devices that are expensive to produce and assemble and difficult to package. It is exactly these difficulties with prior art designs that [Engelgau] resolves. The use of an adjustable pedal with a single pivot reflecting pedal position combined with an electronic control mounted between the support and the adjustment assembly at that pivot was a simple, elegant, and novel combination of features in the Engelgau '565 patent." *Id.*, at 206, ¶16.

Read in the context of the declaration as a whole this is best interpreted to mean that Asano could not be used to solve "[t]he problem addressed by Engelgau '565[:] to provide a less expensive, more quickly assembled, and smaller package adjustable pedal assembly with electronic control." *Id.*, at 205, ¶10.

The District Court found that combining Asano with a pivot-mounted pedal position sensor fell within the scope of claim 4. 298 F.Supp.2d, at 592–593. Given the significance of that finding to the District Court's judgment, it is apparent that Teleflex would have made clearer challenges to it if it intended to preserve this claim. In light of Teleflex's failure to raise the argument in a clear fashion, and the silence of the Court of Appeals on the issue, we take the District Court's conclusion on the point to be correct.

B

[7] The District Court was correct to conclude that, as of the time Engelgau designed the subject matter in claim 4, it was obvious to a person of ordinary skill to combine Asano with a pivot-mounted pedal position sensor. There then existed a marketplace that created a strong incentive to convert mechanical pedals to

electronic pedals, and the prior art taught a number of methods for achieving this advance. The Court of Appeals considered the issue too narrowly by, in effect, asking whether a pedal designer writing on a blank slate would have chosen both Asano and a

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modular sensor similar to the ones used in the Chevrolet truckline and disclosed in the '068 patent. The District Court employed this narrow inquiry as well, though it reached the correct result nevertheless. The proper question to have asked was whether a pedal designer of ordinary skill, facing the wide range of needs created by developments in the field of endeavor, would have seen a benefit to upgrading Asano with a sensor.

In automotive design, as in many other fields, the interaction of multiple components means that changing one component often requires the others to be modified as well. Technological developments made it clear that engines using computer-controlled throttles would become standard. As a result, designers might have decided to design new pedals from scratch; but they also would have had reason to make pre-existing pedals work with the new engines. Indeed, upgrading its own pre-existing model led KSR to design the pedal now accused of infringing the Engelgau patent.

For a designer starting with Asano, the question was where to attach the sensor. The consequent legal question, then, is whether a pedal designer of ordinary skill starting with Asano would have found it obvious to put the sensor on a fixed pivot point. The prior art discussed above leads us to the conclusion that attaching the sensor where both KSR and Engelgau put it would have been obvious to a person of ordinary skill.

The '936 patent taught the utility of putting the sensor on the pedal device, not in the engine. Smith, in turn, explained to put the sensor not on the pedal's footpad but instead on its support structure. And from the known wire-chafing problems of Rixon, and Smith's teaching that "the pedal assemblies must not precipitate any motion in the connecting wires," Smith, col. 1, lines 35–37, Supplemental App. 274, the designer would know to place the sensor on a nonmoving part of the pedal structure. The most obvious nonmoving point on the structure from which a sensor can easily detect the pedal's position is a pivot point. The designer, accordingly, would follow Smith in mounting the sensor on a pivot, thereby designing an adjustable electronic pedal covered by claim 4.

Just as it was possible to begin with the objective to upgrade Asano to work with a computer-controlled throttle, so too was it possible to take an adjustable electronic pedal like Rixon and seek an improvement that would avoid the wire-chafing problem. Following similar steps to those just explained, a designer would learn from Smith to avoid sensor movement and would come, thereby, to Asano because Asano disclosed an adjustable pedal with a fixed pivot.

Teleflex indirectly argues that the prior art taught away from attaching a sensor to Asano because Asano in its view is bulky, complex, and expensive. The only evidence Teleflex marshals in support of this argument, however, is the Radcliffe declaration, which merely indicates that Asano would not have solved Engelgau's goal of making a small, simple, and inexpensive pedal. What the declaration does not indicate is that Asano was somehow so flawed that there was no reason to upgrade it, or pedals like it, to be compatible with modern engines. Indeed, Teleflex's own declarations refute this conclusion. Dr. Radcliffe states that Rixon suffered from the same bulk and complexity as did Asano. See *id.*, at 206. Teleflex's other expert, however, explained that Rixon was itself designed by adding a sensor to a pre-existing mechanical pedal. See *id.*, at 209. If Rixon's base pedal was not too flawed to upgrade, then Dr. Radcliffe's declaration does not show Asano was either. Teleflex may have made a plausible argument that Asano is inefficient as compared to Engelgau's preferred embodiment, but to judge Asano against Engelgau would be to engage in the very hindsight bias Teleflex rightly urges must be avoided. Accordingly, Teleflex has not shown anything in the prior art that taught away from the use of Asano.

Like the District Court, finally, we conclude Teleflex has shown no secondary factors to dislodge the determination that claim 4 is obvious. Proper application of *Graham* and our other precedents to these facts therefore leads to the conclusion that claim 4 encompassed obvious subject matter. As a result, the claim fails to meet the requirement of §103.

We need not reach the question whether the failure to disclose Asano during the prosecution of Engelgau voids the presumption of validity given to issued patents, for claim 4 is obvious despite the presumption. We nevertheless think it appropriate to note that the rationale underlying the presumption—that the PTO, in its expertise, has approved the claim—seems much diminished here.

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IV

[8] A separate ground the Court of Appeals gave for reversing the order for summary judgment was the existence of a dispute over an issue of material fact. We disagree with the Court of Appeals on this point as well. To the extent the court understood the *Graham* approach to exclude the possibility of summary judgment when an expert provides a conclusory affidavit addressing the question of obviousness, it misunderstood the role expert testimony plays in the analysis. In considering summary judgment on that question the district court can and should take into account expert testimony, which may resolve or keep open certain questions of fact. That is not the end of the issue, however. The ultimate judgment of obviousness is a legal determination. *Graham*, 383 U.S., at 17. Where, as here, the content of the prior art, the scope of the patent claim, and the level of ordinary skill in the art are not in material dispute, and the obviousness of the claim is apparent in light of these factors, summary judgment is appropriate. Nothing in the declarations proffered by Teleflex prevented the District Court from reaching the careful conclusions underlying its order for summary judgment in this case.

* * *

We build and create by bringing to the tangible and palpable reality around us new works based on instinct, simple logic, ordinary inferences, extraordinary ideas, and sometimes even genius. These advances, once part of our shared knowledge, define a new threshold from which innovation starts once more. And as progress beginning from higher levels of achievement is expected in the normal course, the results of ordinary innovation are not the subject of exclusive rights under the patent laws. Were it otherwise patents might stifle, rather than promote, the progress of useful arts. See U.S. Const., Art. I, §8, cl. 8. These premises led to the bar on patents claiming obvious subject matter established in *Hotchkiss* and codified in §103. Application of the bar must not be confined within a test or formulation too constrained to serve its purpose.

KSR provided convincing evidence that mounting a modular sensor on a fixed pivot point of the Asano pedal was a design step well within the grasp of a person of ordinary skill in the relevant art. Its arguments, and the record, demonstrate that claim 4 of the Engelgau patent is obvious. In rejecting the District Court's rulings, the Court of Appeals analyzed the issue in a narrow, rigid manner inconsistent with §103 and our precedents. The judgment of the Court of Appeals is reversed, and the case remanded for further proceedings consistent with this opinion.

It is so ordered.

- End of Case -

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227 USPQ 972

Ex parte Clapp

U.S. Patent and Trademark Office, Board of Patent Appeals and Interferences

Opinion dated February 28, 1985

Headnotes

PATENTS

[1] Anticipation -- Combining references (► 51.205)

To support conclusion that claimed combination is directed to obvious subject matter, references must either expressly or impliedly suggest claimed combination or examiner must present convincing line of reasoning as to why artisan would have found claimed invention to have been obvious in light of references' teachings.

Case History and Disposition

Application for patent of ThomasR. Clapp, Serial No. 257,162, filed Apr. 24, 1981. From rejection of Claim 9-19, applicant appeals (Appeal No. 553-54). Reversed.

Attorneys

Gomer W. Walters, for appellant.

Judge

Before Bennett, Henon and Spencer, Examiners-in-Chief.

Opinion Text

Opinion By:

Henon, Examiner-in-Chief.

This appeal is from the decision of the examiner rejecting claims 9 through 19, which constitute all the claims remaining in the application.

The invention relates to an auger type mixing apparatus for mixing cementitious materials employing a volatile liquid. Representative claim 9 reads as follows:

9. Apparatus mounted on a vehicle for mixing a cementitious material in which a volatile liquid is employed comprising:
 - an enclosed mixing chamber sealed to prevent the escape of the volatile liquid and any potentially dangerous fumes;
 - a solid frame forming the top of said mixing chamber and having an inlet end thereof pivotably mounted on the vehicle;
 - an easily removable elastomeric trough forming the bottom of said mixing chamber, the elastomeric material selected to be compatible with the materials being mixed;
 - an auger having a central shaft and mounted in said frame to convey materials through said mixing chamber;
 - mixing paddles mounted on the shaft of said auger;
 - a drive motor for said auger mounted on said frame;
 - a releasable flexible coupling between the aligned shafts of said motor and said auger to permit removal of said auger from said frame;
 - an inlet hopper to introduce substantially dry materials into said mixing chamber;

liquid injection means to introduce a liquid into said mixing chamber at a distance removed from said inlet hopper to have said substantially dry material form a plug to prevent the liquid and any fumes from backing up said inlet hopper; and
a discharge opening formed in said elastomeric trough.

The references relied on by the examiner are:

Table set at this point is not available. See table in hard copy or call BNA at 1-800-372-1033.

Claims 9 through 14 and 17 stand rejected as being directed to obvious subject matter within the meaning of 35 U.S.C. 103 in light of the teachings of Zimmerman in view of Wilkinson, Fatty, Lasar, Clemens and Cunningham. The examiner contends that Zimmerman discloses the claimed subject matter except for "having the mixing chamber enclosed with a solid top frame and having a removable auger and having liquid injection means and aligned shafts between the motor and auger and a discharge formed in the elastomeric trough," (final rejection, page 2, paper number 5). The examiner cites Wilkinson as disclosing an enclosed mixing chamber

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where the enclosure comprises an inverted substantially U-shaped top frame portion and concludes that it therefore would be obvious to the artisan to modify the open frame in Zimmerman to be an enclosed mixing chamber as taught by Wilkinson "if desired." Since Wilkinson also discloses the concept of providing liquid injection means for the introduction of liquid into a mixing chamber remote from the inlet hopper, the examiner concludes that it would therefore be obvious to modify Zimmerman accordingly. Since Lasar discloses the concept of having an auger with mixing paddles mounted thereon wherein the auger is releasably coupled to a frame, the examiner concludes that it would have been obvious to the artisan to modify the auger in Zimmerman as taught by Lasar. Fatty is cited to show that it is well known to provide coaxial alignment between an auger shaft and the shaft of a driving motor. Clemens is cited as disclosing the concept of having a discharge opening in a trough. The examiner concludes that it would have been obvious in light of Fatty and Clemens to modify the auger motor alignment and discharge opening of Zimmerman to be of the nature suggested by Fatty and Clemens. Cunningham is cited as disclosing seal means to preclude leakage of the material within the mixing chamber. The examiner concludes that it would have been obvious in light of the teachings of Cunningham to employ seal means on the *modified* device of Zimmerman.

Claim 15 stands rejected as being directed to obvious subject matter under 35 U.S.C. 103 in light of the combined teachings of Zimmerman, Wilkinson, Fatty, Lasar, Clemens, Cunningham and August. Combining the teachings of Zimmerman, Wilkinson, Fatty, Lasar, Clemens and Cunningham in the manner specified supra, the examiner concludes that it would have been further obvious to the artisan in light of the teachings of August to provide spray elements with selectively activated controls since August teaches such devices to be known.

Claims 16, 18 and 19 stand rejected as being directed to obvious subject matter under 35 U.S.C. 103 in light of the combined teachings of Zimmerman, Wilkinson, Fatty, Lasar, Clemens, Cunningham and Tiemersma. Combining the teachings of Zimmerman, Wilkinson, Fatty, Lasar, Clemens and Cunningham in the manner specified supra, the examiner concludes that it would have been obvious to further modify the structure of Zimmerman to include a gas-filled bearing housing for sealing purposes.

Rather than reiterate the arguments of appellant and the examiner, reference is made to the brief and answer for the respective details thereof.

Opinion

We will not sustain any of the rejections.

[1] Presuming arguendo that the references show the elements or concepts urged by the examiner, the examiner has presented no line of reasoning, and we know of none, as to why the artisan viewing only the collective teachings of the references would have found it obvious to selectively pick and choose various elements and/or concepts from the several references relied on to arrive at the claimed invention. In the instant application, the examiner has done little more than cite references to show that one or more elements or subcombinations thereof, when each is viewed in a vacuum, is known. The claimed invention, however, is clearly directed to a combination of elements. That is to say, appellant does not claim that he has invented one or more new elements but has presented claims to a new combination of elements. To support the conclusion that the claimed combination is directed to obvious subject matter, either the references must expressly or impliedly suggest the claimed combination or the examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references. We find nothing in the references that would expressly or impliedly teach or

suggest the modifications urged by the examiner. Additionally, as aforementioned, we find no line of reasoning in the answer, and we know of none, as to why the artisan would have found the modifications urged by the examiner to have been obvious. Based upon the record before us, we are convinced that the artisan would not have found it obvious to selectively pick and choose elements or concepts from the various references so as to arrive at the claimed invention without using the claims as a guide. It is to be noted that simplicity and hindsight are not proper criteria for resolving the issue of obviousness. Note *In re Horn*, 203 USPQ 969, 971 (CCPA 1979). Accordingly, we will not sustain any of the rejections presented.

The decision of the examiner rejecting claims 9 through 19 as being directed to obvious subject matter within the meaning of 35 U.S.C. 103 is *reversed*.

- End of Case -

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Source: USPQ, 2d Series (1986 - Present) > U.S. Court of Appeals, Federal Circuit > In re Gorman, 18 USPQ2d 1885 (Fed. Cir. 1991)

18 USPQ2d 1885
In re Gorman
U.S. Court of Appeals Federal Circuit

No. 90-1362

Decided May 13, 1991

933 F2d 982

Headnotes

PATENTS

[1] Patentability/Validity - Obviousness - Combining references (► 115.0905)

Patent and Trademark Office's reliance on teachings of large number of references in rejecting patent application for obviousness does not, without more, weigh against holding of obviousness on appeal, since criterion is not number of references, but whether references are in fields which are same as or analogous to field of invention, and whether their teachings would, taken as whole, have made invention obvious to person skilled in that field.

[2] Patentability/Validity - Construction of claims (► 115.03)

Patentability/Validity - Obviousness - In general (► 115.0901)

Claim which describes features of invention in great detail is nevertheless obvious in view of prior art, since claim that is narrowly and specifically drawn must still meet requirements of 35 USC 103, and details listed in claim are shown in references and thus do not contribute to unobviousness.

[3] Patentability/Validity - Obviousness - Relevant prior art - Particular inventions (► 115.0903.03)

Patentability/Validity - Obviousness - Combining references (► 115.0905)

Application claim for candy sucker on stick, molded in elastomeric mold in shape of human thumb, is obvious in view of prior art, since all elements of claim, including molded lollipop having chewing gum base plug, with elastomeric mold serving as product wrapper, and candy in shape of human thumb, are shown in prior art references in various subcombinations, used in same manner and for same purpose as in claimed invention.

Case History and Disposition

Page 1886

Appeal from the U.S. Patent and Trademark Office, Board of Patent Appeals and Interferences.

Patent application of Jeffrey B. Gorman and Marilyn Katz, serial no. 06/882,480 (composite food product). From decision of Board of Patent Appeals and Interferences upholding examiner's rejection of all claims in application, applicants appeal. Affirmed.

Attorneys

Thomas W. Tolpin, Highland Park, Ill., for appellant.

Teddy S. Gron, associate solicitor (Fred E. McKelvey, solicitor, with him on brief), for appellee.

Judge

Before Rich, Newman, and Rader, circuit judges.

Opinion Text

Opinion By:

Newman, J.

Jeffrey B. Gorman and Marilyn Katz (hereinafter "Gorman") appeal the decision of the United States Patent and Trademark Office, Board of Patent Appeals and Interferences (the "Board") denying patentability to all the claims of Gorman's patent application Serial No. 06/882,480, entitled "Composite Food Product." We affirm.

The Invention

The claimed invention is a composite candy sucker on a stick, molded in an elastomeric mold in the shape of a human thumb. During the manufacturing process liquid candy is poured into the mold, and an edible plug of bubble or chewing gum or chocolate or food-grade wax is poured into the mold after the candy has hardened, serving as a seal for the end portion of the candy. A paper or plastic disc abuts and covers the plug. The mold serves as a cover that can be removed from the candy by means of protruding flanges. The cover is described as a "toy and novelty item".

Figure 1 shows the invention in the form in which it is marketed. Figure 2 shows the cover partially removed to reveal the candy portion (12) and the chewable or edible plug (58):

The claims describe the product in detail, as is apparent from claim 16, the claim pressed by Gorman in this appeal:

16. A composite food product, comprising:

a candy core, said candy core being in a generally liquified form when formulated, heated, blended and poured into a mold and in a substantially thumb-shaped hardened form when cooled and removed from said mold;

said thumb-shaped hardened form comprising said candy core positioned along a vertical axis and comprising a rigid joint-shaped portion, a rigid upper portion extending upwardly from said rigid joint-shaped portion along said vertical axis, and a rigid lower portion extending downwardly from said rigid joint-shaped portion along said vertical axis, said upper portion having a rigid finger nail-shaped portion with an upper rigid tip providing a rigid top end of said thumb-shaped hardened form and a rigid convex back extending rearwardly and downwardly from said rigid tip, and said rigid lower portion having a rigid bottom end and defining a recessed opening comprising a handle-receiving socket about said vertical axis;

a removable resilient shell comprising a substantially thumb-shaped, elastomeric material selected from the group consisting of rubber and flexible plastic, said shell providing

a mold for receiving and molding said liquified candy form,

a removable outer protective cover positioned about and covering said hardened form comprising said candy core, and

a toy and novelty item for placement upon the thumb of the user when removed from said hardened form comprising said candy core;

said thumb-shaped elastomeric material comprising said removable resilient shell comprising a flexible joint-shaped portion, a flexible upper portion extending upwardly from said flexible joint-shaped portion along said vertical axis, and a flexible lower portion extending downwardly from said flexible joint-shaped portion along said vertical axis, said upper portion having a flexible finger nail-shaped portion with an upper flexible tip providing a flexible top end of said shell and a flexible convex back extending rearwardly and downwardly from said flexible tip, and said flexible lower portion having an enlarged open ended diverging base, said base having a larger circumference and transverse cross-sectional area than other portions of said shell and providing the bottom of said shell, said open ended base defining a plug-receiving chamber and an access opening for entrance of said liquified form and discharge of said hardened candy form, and a set of substantially symmetrical arcuate lobes extending radially outwardly from said base, said lobes being circumferentially spaced from each other and providing manually grippable flange portions to facilitate manual removal of said shell from said core;

a plug positioned in said plug-receiving chamber adjacent said bottom of said shell, said plug abutting against the bottom of said core and providing a cap for substantially plugging and sealing the open end of said mold and cover to help enclose said candy core, and said plug comprising a food grade material selected from the group consisting of bubble gum, chewing gum, chocolate, and food grade wax;

a handle having a connecting portion connected to said plug and said candy core and positioned in said plug-receiving opening and having a manually grippable handle portion extending downward from said connecting portion along said vertical axis; and

a substantially planar annular disk for abuttingly engaging and removably seating against said base and said lobes adjacent said plug, said disk defining a central axial hole for slidably receiving said handle portion and having an outer edge with a maximum span larger than said access opening but less than the maximum diameter of said symmetrical set of lobes to substantially minimize the interference with manually gripping of said manual grippable flange portions of said lobes, said disk being of a material selected from the group consisting of paper, paperboard, and plastic, and providing a removable closure member and seal for substantially closing said access opening and sealing said plug and said candy core within said shell.

The claims were rejected in view of thirteen references. The primary references, patents to Siciliano, Copeman, and Pooler, show ice cream or candy molded in a plastic, rubber or elastomeric mold. In Siciliano and Copeman the mold also serves as the product wrapper. In Siciliano the ice cream is poured into the mold, a stick is inserted, the ice cream is hardened, and a cardboard cover seals the area between the stick and the elastomeric wrapper. Copeman and Kuhlke show candy lollipops molded in elastomeric molds. Copeman states that the mold may take "varying shapes, such as in the form of fruit, or animals" and Kuhlke discusses the desirability of sealing candy from the outside air. In Siciliano, Copeman and Kuhlke, the mold is peeled from the confection prior to use.

The two Nolte patents teach that gripping flanges may be placed on an ice cream wrap

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per to facilitate removal. Ahern and Knaust each show a disc-shaped seal or cover for a frozen confection. Ahern shows the cover in conjunction with ice cream on a stick.

Harris shows a hollow thumb-shaped lollipop into which the thumb is inserted, and Craddock shows a thumb-shaped confection supported on a disc-shaped handle; in both cases without the other elements shown by Gorman. Fulkerson shows a candy coating surrounding a block of ice cream, and a candy plug for retaining liquid syrup inside a cavity in the ice cream. Webster shows chewing gum entirely enclosing a liquid syrup product. Spiegel shows a chocolate layer having an alcohol diffusion barrier to plug the end of a plastic container of liqueur. Fulkerson, Webster and Spiegel all suggest the greater appeal to consumers of providing two different components in the same confection.

The Board found that all of the features of Gorman's product were known to the art, and that various combinations of these elements existed in known similar structures. The Board concluded that the applicant's claimed combination was suggested by and would have been obvious in light of the references.

Discussion

A

Each element of the Gorman claims is in the prior art, separately or in sub-combination. Gorman argues that when it is necessary to combine the teachings of a large number of references in order to support a rejection for obviousness under 35 U.S.C. §103, this of itself weighs against a holding of obviousness.

[1] The criterion, however, is not the number of references, but what they would have meant to a person of ordinary skill in the field of the invention. In *Hybritech, Inc. v. Monoclonal Antibodies, Inc.*, 802 F.2d 1367, 1383, 231 USPQ 81, 93 (Fed.Cir. 1986), cert. denied, 480 U.S. 947 (1987), the court held that a combination of about twenty references that "skirt[ed] all around" the claimed invention did not show obviousness. In other instances, on other facts, we have upheld reliance on a large number of references to show obviousness. Compare *In re Miller*, 159 F.2d 756, 758-58, 72 USPQ 512, 514-15 (CCPA 1947) (rejecting argument that the need for eight references for rejection supported patentability) with *Kansas Jack, Inc. v. Kuhn*, 719 F.2d 1144, 1149, 219 USPQ 857, 860 (Fed.Cir. 1983) (where teachings relied upon to show obviousness were repeated in a number of references, the conclusion of obviousness was strengthened). See also, e.g., *In re Troiel*, 274 F.2d 944, 947, 124 USPQ 502, 504 (CCPA 1960) (rejecting appellant's argument that combining a large number of references to show obviousness was "farfetched and illogical").

Determination of whether a new combination of known elements would have been obvious to one of ordinary

skill depends on various facts, including whether the elements exist in "analogous art", that is, art that is reasonably pertinent to the problem with which the inventor is concerned. *In re Deminski*, 796 F.2d 436, 442, 230 USPQ 313, 315 (Fed.Cir. 1986). When the references are all in the same or analogous fields, knowledge thereof by the hypothetical person of ordinary skill is presumed, *In re Sernaker*, 702 F.2d 989, 994, 217 USPQ 1, 5 (Fed.Cir. 1983), and the test is whether the teachings of the prior art, taken as a whole, would have made obvious the claimed invention. See *In re Young*, 927 F.2d 588, 591, 18 USPQ2d 1089, 1091 (Fed.Cir. 1991).

When it is necessary to select elements of various teachings in order to form the claimed invention, we ascertain whether there is any suggestion or motivation in the prior art to make the selection made by the applicant. *Interconnect Planning Corp. v. Feil*, 774 F.2d 1132, 1143, 227 USPQ 543, 551 (Fed.Cir. 1985). "Obviousness can not be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching, suggestion or incentive supporting the combination." *In re Bond*, 910 F.2d 831, 834, 15 USPQ2d 1566, 1568 (Fed.Cir. 1990) (quoting *Carella v. Starlight Archery and Pro Line Co.*, 804 F.2d 135, 140, 231 USPQ 644, 647 (Fed.Cir. 1986)).

The extent to which such suggestion must be explicit in, or may be fairly inferred from, the references, is decided on the facts of each case, in light of the prior art and its relationship to the applicant's invention. As in all determinations under 35 U.S.C. §103, the decisionmaker must bring judgment to bear. It is impermissible, however, simply to engage in a hindsight reconstruction of the claimed invention, using the applicant's structure as a template and selecting elements from references to fill the gaps. *Interconnect Planning*, 774 F.2d at 1143, 227 USPQ at 551. The references themselves must provide some teaching whereby the applicant's combination would have been obvious.

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B

Gorman argues that the references showing ice cream in a mold or wrapper on a stick and the references showing candy in a mold or wrapper on a stick are not analogous, for they require different conditions of production. However, the Copeman reference shows the close relationship of these arts, stating that his elastomeric mold may be used for "frozen confections and other solid confections". We conclude that the ice cream on a stick and candy on a stick arts are analogous, and that the Siciliano, Copeman, Pooler, and Kuhlke references show or suggest Gorman's candy on a stick and covered with an elastomeric mold, for which the thumb-shape is shown by Harris or Craddock.

The suggestion of providing a layer of chewing gum, chocolate or the like, surrounding the candy core in the area not covered by the mold, to seal the candy and provide a second food product, is provided by Fulkerson, Webster, or Spiegel. The paper disc adjacent the base of the candy structure is shown in Ahern and Knaust. Harris and Craddock both show thumb-shaped candy. Gorman argues that the prior art does not suggest using the thumb-shaped cover as a toy after the candy is removed. However, Copeman states that his rubber mold may be used as a "toy balloon" after the candy is removed. Gorman argues that Craddock teaches away from the claimed invention because of Craddock's admonition that lollipops on sticks are dangerous to children. However, candy on a stick is too well known for this caution to contribute to unobviousness.

[2] Claim 16 recites details such as a "joint-shaped portion", a "finger nail portion", an "upper portion", a "lower portion" and a "convex back", as descriptive of the thumb shape. Such details are shown in the references and do not contribute to unobviousness. A claim that is narrowly and specifically drawn must nevertheless meet the requirements of §103:

The mere fact that a claim recites in detail all of the features of an invention (i.e., is a "picture claim") is never, in itself, justification for the allowance of such a claim.

Manual of Patent Examining Procedure, §706 (Rev. 6, Oct. 1987) at p. 700-6; *In re Romito*, 289 F.2d 518, 129 USPQ 359 (CCPA 1961) (rejecting a "picture claim").

[3] Applying the principles of *Graham v. John Deere & Co.*, 383 U.S. 1, 17, 148 USPQ 459, 467 (1966), we discern all of the elements of claim 16, used in substantially the same manner, in devices in the same field of endeavor. The various elements Gorman combined: the molded lollipop with a chewing gum plug, with the mold serving as the product wrapper; and candy in the shape of a thumb; are all shown in the cited references in various sub-combinations, used in the same way, for the same purpose as in the claimed invention. The Board did not, as Gorman argues, pick and choose among isolated and inapplicable disclosures in the prior art. Rather, the claim elements appear in the prior art in the same configurations, serving the same functions, to achieve the results suggested in prior art. *In re Sernaker*, 702 F.2d at 994, 217 USPQ at 5. The large number of cited references does not negate the obviousness of the combination, for the prior art

uses the various elements for the same purposes as they are used by appellants, making the claimed invention as a whole obvious in terms of 35 U.S.C. §103.

The Board's decision is *AFFIRMED*.

- End of Case -

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Source: USPQ, 2d Series (1986 - Present) > U.S. Court of Appeals, Federal Circuit > Princeton Biochemicals Inc. v. Beckman Coulter Inc., 75 USPQ2d 1051 (Fed. Cir. 2005)

75 USPQ2d 1051
Princeton Biochemicals Inc. v. Beckman Coulter Inc.
U.S. Court of Appeals
Federal Circuit

No. 04-1493

Decided June 9, 2005

411 F3d 1332

Headnotes

PATENTS

[1] Patentability/Validity — Obviousness — References and claims as whole (► 115.0904)

Patentability/Validity — Obviousness — Combining references (► 115.0905)

Asserted claim of patent for capillary electrophoresis device would have been obvious at time of invention in view of combination of prior art references, since evidence shows that all eight elements of asserted claim were separately known in prior art, since infringement defendant offered un rebutted expert testimony stating that both individual ideas underlying invention and combination thereof would have been obvious, and such testimony is consistent with prior art introduced at trial, since expert supplied detailed analysis of prior art and reasons why person of ordinary skill would possess knowledge and motivation to combine elements, and since nature of problem addressed by invention called for solutions existing in prior art, as well as claimed combination of closely related prior art elements.

[2] Patentability/Validity — Obviousness — Relevant prior art — Particular inventions (► 115.0903.03)

Federal district court hearing action for infringement of patent for capillary electrophoresis apparatus properly concluded that references on which it based its obviousness analysis, including those within related field of liquid chromatography, were appropriate prior art, since, during prosecution, examiner consistently rejected first six elements of asserted claim as obvious, citing references ranging from capillary electrophoresis to liquid chromatography, since district court itemized other references in chemical separations field, describing their relation to electrophoretic separation, chromatography, or both, and further established that capillary electrophoresis is closely related to types of electrophoresis described in some of cited references, since defendant's expert testified that person of ordinary skill in art would look to these related fields to solve problems in capillary electrophoresis field, and since district court examined whether references were reasonably pertinent to particular problems addressed by asserted claim, and properly determined that references addressed those problems in same manner as elements of claim.

Particular Patents

Particular patents — Chemical — Electrophoresis

5,045,172, Guzman, capillary electrophoresis apparatus, judgment of invalidity affirmed.

Case History and Disposition

Appeal from the U.S. District Court for the District of New Jersey, Cooper, J.

Action by Princeton Biochemicals Inc. against Beckman Coulter Inc. for patent infringement. Jury found for plaintiff on issues of validity and infringement, but district court granted defendant's motion for judgment as matter of law, holding patent in suit invalid for obviousness. Plaintiff appealed. Affirmed.

Prior decision: 45 USPQ2d 1757.

Attorneys

William G. Todd and Scott J. Bornstein, of Greenberg Traurig, New York, N.Y., for plaintiff-appellant.

Joseph R. Re, Darrell L. Olson, Douglas G. Muehlhauser, and Christy G. Lea, of Knobbe, Martens, Olson & Bear, Irvine, Calif., for defendant-appellee.

Judge

Before Rader, Schall, and Gajarsa, circuit judges.

Opinion Text

Opinion By:

Rader, J.

In the United States District Court for the District of New Jersey, a jury found in favor of Plaintiff-Appellant Princeton Biochemicals, Inc. (Princeton), rejecting the claims of Defendant-Appellee Beckman Coulter, Inc. (Beckman) that Princeton's U.S. Patent No. 5,045,172 (the '172 patent) is invalid by reason of obviousness and prior invention, and finding that Beckman infringed the '172 patent. On all three questions, however, the district court found the jury's verdict unsupported by substantial evidence and granted judgment as a matter of law (JMOL) in favor

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of Beckman. *Princeton Biochemicals, Inc. v. Beckman Coulter, Inc.*, No. 96-5541 (MLC), 2004 WL 1398227 (D.N.J. June 17, 2004). Because the district court properly concluded that substantial evidence did not support the jury's verdict of nonobviousness, this court affirms.

I.

Dr. Norberto Guzman is the inventor of the '172 patent, which he assigned to Princeton. The '172 patent claims a capillary electrophoresis device. Electrophoresis is one method available for the investigation of biological materials, and is an efficient procedure for the separation and detection of proteins and other matter. '172 patent, col. 1, ll. 16-20. Electrophoretic separation, one species of electrophoresis, relies on the differential speeds of the migration of differently charged particles in an electric field. *Id.* at col. 1, ll. 21-23. Capillary electrophoresis is one type of electrophoretic separation. *Id.* at col. 1, ll. 17-20. As the '172 patent describes,

[I]t is generally known that a material, containing mixtures of substances to be analyzed, can be passed along a capillary tube and through a detector under the influence of an applied voltage. The applied voltage charges the substances and the charges on the substances determine their spacing and their speed of passage along the capillary tube.

Id. at col. 2, ll. 32-38. Capillary tubes, generally made of quartz, range in lengths of roughly 10 to 100 centimeters and 25-200 microns in diameter. *Id.* at col. 1, ll. 50-58. Due to the dimensions of a tube, capillary electrophoresis requires only a minute sample size to efficiently separate and identify the components of a solution.

Claim 32 of the '172 patent claims a specific capillary electrophoresis device:

Capillary electrophoresis apparatus comprising a capillary tube of the type which can be electrically charged, said capillary tube having first and second ends, first means at said first end of said capillary tube providing a source of buffer solution and a source of a sample substance to be analyzed,

second means coupled to said apparatus for applying electrical potential across said capillary tube whereby a sample flows through said capillary tube and past said detector,

said first means includes a rotatable table carrying a plurality of sample cups and a holder for holding an end of said capillary tube in operative relation with one of the said cups, said cups containing either buffer solution or a sample to be analyzed, and

said capillary tube is in the form of a coil of glass tubing [secured to a support

member]. *

* The words "secured to a support member" are not present in the final, published version of the '172 patent. The parties stipulated at trial that this was a printing error only. Those words appear in claim 32 as issued.

Id. at col. 23, ll. 30-47 (emphases added). The parties stipulated that claim 32 contains eight elements, as follows:

Capillary electrophoresis apparatus comprising:

- (1) a capillary tube of the type which can be electrically charged,
- (2) said capillary tube having first and second ends,
- (3) first means at said first end of said capillary tube providing a source of buffer solution and a source of sample substance to be analyzed,
- (4) second means coupled to said apparatus for applying electrical potential across said capillary tube whereby a sample flows through said capillary tube and past said detector,
- (5) said first means includes a rotatable table carrying a plurality of sample cups and
- (6) a holder for holding an end of said capillary tube in operative relation with one of the said cups, said cups containing either buffer solution or a sample to be analyzed, and
- (7) said capillary tube is in the form of a coil of glass tubing
- (8) secured to a support member.

Id.

Beckman manufactures and sells the P/ACE 2000 and 5000 Series capillary electrophoresis devices ("the accused devices" or

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"the P/ACE devices"). Beckman contends a prototype device, named OTEP II, contained all the elements recited in claim 32. Princeton does not contest that Beckman made OTEP II by February 1, 1987. That date, therefore, is the relevant reduction-to-practice date for the P/ACE devices. Beckman began selling P/ACE devices as early as 1993.

Guzman filed the application for the '172 patent on November 14, 1988. Thus, the critical date for evaluating 35 U.S.C. §102(b) prior art references is November 14, 1987. Several references, published before November 14, 1987, discussed the electrophoretic concepts embodied in claim 32 of the '172 patent. Two particular references stand out. The first, an article by Honda dated September 1987, describes ways to introduce automatically different samples into a capillary electrophoresis device. Susumu Honda, et. al., "Evaluation of an Automatic Siphonic Sampler for Capillary Zone Electrophoresis," *Int'l J. on Chromatography, Electrophoresis and Related Methods*. The second, a Ph.D. thesis by Lukacs, was published in 1983 by a graduate student of Dr. James W. Jorgenson, an expert who testified on behalf of Beckman. The Lukacs thesis discloses the coiling of capillary tubes during electrophoretic work. Coiling a capillary tube lengthens the tubing without increasing the size of the electrophoretic device. A longer tube provides better separation and identification of analytes.

On November 21, 1996, Princeton filed suit, alleging that the P/ACE devices infringed claim 32 of the '172 patent. Beckman denied infringement and sought a declaration of invalidity on grounds of obviousness and prior invention. Following a grant of summary judgment of noninfringement, Princeton appealed. In an unpublished opinion, this court reversed, holding that the district court had improperly construed the sixth element in claim 32. *Princeton Biochemicals, Inc. v. Beckman Instruments, Inc.*, 1999 WL 641233, at *6 (Fed. Cir. 1999) ("The proper interpretation of the holder limitation is that 'in operative relation' encompasses both vertical movement of the holder as well as vertical movement of the sample cups and the table.").

On remand, the district court conducted a nine-day trial followed by motions for JMOL from both parties. The district court reserved judgment until after the jury verdict. The jury decided in favor of Princeton on all issues. Specifically, the jury found that Princeton proved by a preponderance of the evidence that Beckman's devices infringed claim 32 of the '172 patent; that Beckman did not prove by clear and convincing evidence that claim 32 of the patent was invalid for obviousness; and finally, that Beckman did not prove "by clear and

convincing evidence that claim 32 is invalid because the invention described in that claim was made by Beckman before it was made by Princeton." Beckman timely renewed its JMOL motion and moved alternatively for a new trial.

In due course, the district court issued a carefully composed, 194-page opinion that set aside the jury's verdict and found all counts in favor of Beckman. *Princeton Biochemicals, Inc.*, 2004 WL 1398227. The district court also granted Beckman's motion for a new trial. *Id.* at *91. Princeton timely appealed to this court. This court has jurisdiction under 28 U.S.C. §1295(a)(1).

II.

"The grant or denial of a motion for judgment as a matter of law is a procedural issue not unique to patent law, reviewed under the law of the regional circuit in which the appeal from the district court would usually lie." *Summit Tech., Inc. v. Nidek Co.*, 363 F.3d 1219, 1223 [70 USPQ2d 1276] (Fed. Cir. 2004). Under the law of the Third Circuit, review of a district court's ruling on JMOL is plenary. *Shellenberger v. Summit Bancorp, Inc.*, 318 F.3d 183, 186 (3rd Cir. 2003). The party requesting the JMOL must show that substantial evidence did not support the jury's findings, where substantial evidence is "such relevant evidence from the record taken as a whole as might be accepted by a reasonable mind as adequate to support the finding under review." *Tex. Instruments Inc. v. Cypress Semiconductor Corp.*, 90 F.3d 1558, 1563 [39 USPQ2d 1492] (Fed. Cir. 1996). This court must also consider all the evidence before the jury and draw all reasonable inferences in favor of the prevailing party on that issue, i.e., the non-movant. *Richardson-Vicks Inc. v. Upjohn Co.*, 122 F.3d 1476, 1479 [44 USPQ2d 1181] (Fed. Cir. 1997). Regarding the obviousness issue in this case, this court must determine whether the jury had substantial evidence upon which to conclude that Beckman

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met its burden of showing invalidity by clear and convincing evidence.

This court also reviews the legal standards that the jury applied in reaching its verdict to determine whether they were correct as a matter of law. *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 975 [34 USPQ2d 1321] (Fed. Cir. 1995) (*en banc*), *aff'd*, 517 U.S. 370, 134 L. Ed. 2d 577, 116 S. Ct. 1384 [38 USPQ2d 1461] (1996). When reviewing a jury's verdict on obviousness the court reviews the "conclusions on obviousness, a question of law, without deference, and the underlying findings of fact, whether explicit or implicit within the verdict, for substantial evidence." *LNP Eng'g Plastics, Inc. v. Miller Waste Mills, Inc.*, 275 F.3d 1347, 1353 [61 USPQ2d 1193] (Fed. Cir. 2001). Specifically, the jury is presumed to have "resolved the underlying factual disputes in favor of the verdict winner and [this court leaves] those presumed findings undisturbed if they are supported by substantial evidence". *Jurgens v. McKasy*, 927 F.2d 1552, 1557 [18 USPQ2d 1031] (Fed. Cir. 1991).

III.

Section 103 of title 35 of the United States Code states:

A patent may not be obtained ... if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.

35 U.S.C. §103(a) (2000). The legal conclusion, that a claim is obvious within §103(a), depends on at least four underlying factual issues: (1) the scope and content of the prior art; (2) differences between the prior art and the claims at issue; (3) the level of ordinary skill in the pertinent art; and (4) evaluation of any relevant secondary considerations. See *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1, 17 [148 USPQ 459] (1966). Analyzing the record support for those factors for Beckman's Rule 50(b) motion, the trial court concluded that claim 32 was obvious. Thus, the court granted Beckman's motion for JMOL, set aside the jury verdict rejecting the obviousness challenge, and entered judgment invalidating claim 32.

There is no dispute that the references introduced at trial disclosed every element in claim 32. Guzman admitted this in his testimony at trial. Thus, aside from the relevance of the asserted references, the only disputed issue at trial, and asserted on appeal, was whether there was motivation to combine the elements already present in the prior art. As this court outlined in *Ruiz v. A.B. Chance Co.*, 357 F.3d 1270, 1275 [69 USPQ2d 1686] (Fed. Cir. 2004), in making the assessment of differences between the prior art and the claimed subject matter, section 103 specifically requires consideration of the claimed invention "as a whole." Inventions typically are new combinations of existing principles or features. *Env'tl. Designs, Ltd. v. Union Oil Co.*, 713 F.2d 693, 698 [218 USPQ 865] (Fed. Cir. 1983) (noting that "virtually all [inventions] are combinations of old elements"). The "as a whole" instruction in title 35 prevents evaluation of the invention part by part. *Ruiz*, 357 F.3d at 1275. Without this important requirement, an obviousness assessment might

successfully break an invention into its component parts, then find a prior art reference corresponding to each component. *Id.* This line of reasoning would import hindsight into the obviousness determination by using the invention as a roadmap to find its prior art components. Further, this improper method would discount the value of combining various existing features or principles in a new way to achieve a new result - often the essence of invention. *Id.*

Contrary to this reasoning, section 103 requires assessment of the invention as a whole. *Id.* This "as a whole" assessment of the invention requires a showing that an artisan of ordinary skill in the art at the time of invention, confronted by the same problems as the inventor and with no knowledge of the claimed invention, would have selected the various elements from the prior art and combined them in the claimed manner. *Id.* In other words, section 103 requires some suggestion or motivation, before the invention itself, to make the new combination. See *In re Rouffet*, 149 F.3d 1350, 1355-56 [47 USPQ2d 1453] (Fed. Cir. 1998).

[1] In setting aside the jury's verdict and holding claim 32 obvious, the district court systematically and vigilantly considered the relevant prior art references and testimony of

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both parties. The Honda article relates to claim 32's first six elements and describes an automated capillary electrophoresis device with a rotatable table carrying a plurality of sample cups. Princeton does not contest that the Honda article discloses elements one through six. Therefore, at the time of Princeton's claim 32 invention, the prior art had disclosed elements one through six.

With respect to the seventh element, the district court found that the Lukacs thesis disclosed the construction and use of a coiled glass capillary in a capillary electrophoresis apparatus. *Princeton Biochemicals, Inc.*, 2004 WL 1398227, at *40. Additionally, Dr. Jorgenson testified about Ms. Lukacs's work with coiled capillaries based on his own observations in the laboratory with Ms. Lukacs. He noted that they coiled glass capillaries that were two to three meters and longer. *Id.* at *24. In light of the Lukacs thesis, Dr. Guzman conceded at trial that he was not the first to coil a capillary in an electrophoresis device. *Id.* at *40. Therefore, at the time of Princeton's claim 32 invention, element 7 was also known in the prior art.

Element 8 of claim 32 recites the requirement that the capillary tube of claim 32, in the form of glass tubing, must be "secured to a support member." At trial, Dr. Guzman testified that he did not invent "securing capillary tubes or any portion thereof to support members" and did not deny that this element was "old" or that it did not "add" anything new to the claim. From this, the district court correctly concluded that element 8 was known in the prior art. *Id.* at *40. Furthermore, in its brief to this court, Princeton conceded that elements one through eight were separately known in the prior art.

As discussed, simply identifying all of the elements in a claim in the prior art does not render a claim obvious. *Ruiz*, 357 F.3d at 1275. Instead section 103 requires some suggestion or motivation in the prior art to make the new combination. *Rouffet*, 149 F.3d at 1355-56. A suggestion or motivation to modify prior art teachings may appear in the content of the public prior art, in the nature of the problem addressed by the invention, or even in the knowledge of one of ordinary skill in the art. *SIBIA Neurosciences, Inc. v. Cadus Pharm. Corp.*, 225 F.3d 1349, 1356 [55 USPQ2d 1927] (Fed. Cir. 2000).

Dr. Jorgenson testified that the motivation to combine these references was found in the knowledge of those skilled in the art at the time of Guzman's invention. See *SIBIA Neurosciences, Inc.*, 225 F.3d at 1356 (stating that motivation, suggestion or reason to combine items of prior art may come from the knowledge of one of ordinary skill in the art). As Jorgenson explained:

[T]he combination is obvious. Every one of the individual ideas is obvious. And the combination is absolutely obvious. Everybody in all of the related fields in all of the related technologies is doing those kinds of things The entire package taken together is obvious.

Id. Princeton offered no evidence to rebut Dr. Jorgenson's testimony.

Dr. Jorgenson's testimony on motivation to combine is un rebutted. Moreover, it is consistent with the prior art introduced at trial. The only additions to the Honda prior art in this invention were coiling the capillaries (Lukacs prior art) and supporting the coils (concededly prior art). Both of those simple additions appear in other prior art references. Thus, Dr. Jorgenson testified, without any rebutting evidence in the record, that the suggestion to coil and secure the capillaries in the Honda device was within the knowledge of one of skill in the art. In *In re Lee*, this court expressed skepticism about invoking the knowledge of a skilled artisan to supply the motivation to combine on a scanty record. 277 F.3d 1338, 1343-44 [61 USPQ2d 1430] (Fed. Cir. 2002) ("This factual question of motivation ... could not be resolved on subjective belief and unknown authority."). Dr. Jorgenson supplied detailed analysis of the prior art and the reasons that one of ordinary skill

would possess knowledge and motivation to combine these simple elements.

In addition, the nature of the problem supplies a motivation to combine these prior art references. The district court provided a detailed analysis of the nature of the problem solved by the invention. *Princeton Biochemicals, Inc.*, 2004 WL 1398227, at *37-40. The problem was lengthening and securing the capillaries on the Honda automatic device to produce better separation. *Id.* at *38. The prior art Lukacs thesis stated that lengthening was precisely the reason for coiling. *Id.* at *39. With regard to securing, Dr. Osborne, a Beckman

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witness, testified about the problem of a capillary electrophoresis device whose capillary swayed during use and affected the separation result. *Id.* Dr. Osborne observed: "[W]e did not want the capillary to move during the separation." *Id.* In other words, the nature of the problem called for exactly the solutions in the prior art. Moreover the nature of the problem, as noted again in Dr. Jorgenson's testimony, called for the combination. Dr. Jorgenson observed that the problem called for coiled electrophoresis tubes, including capillary tubes, secured in place in a variety of ways. *Id.* He also testified that one of ordinary skill in the art at the time of the invention would know to coil a capillary to save space. *Id.* Regarding the securing of a capillary tube to a support member, Dr. Jorgenson also testified that it would be obvious to one of ordinary skill in the art to do so, as "you don't want a coil floating around without some kind of support." *Id.* Thus, the nature of the problem also supplies a motivation to make this combination of closely related prior art elements.

The district court also properly found that the references for this obviousness analysis were proper prior art. A reference is appropriate prior art if within the field of the inventor's endeavor. *Bausch & Lomb, Inc. v. Barnes-Hind/Hydrocurve, Inc.*, 796 F.2d 443, 449 [230 USPQ 416] (Fed. Cir. 1986). Alternatively, a reference qualifies as prior art if "reasonably pertinent to the particular problem with which the inventor was involved." *Id.* "A reference is reasonably pertinent if, even though it may be in a different field of endeavor, it is one which, because of the matter with which it deals, logically would have commended itself to an inventor's attention in considering his problem." *In re GPAC Inc.*, 57 F.3d 1573, 1578 [35 USPQ2d 1116] (Fed. Cir. 1995) (quotations and citations omitted). If a reference's disclosure relates to the same problem as the claimed invention, "that fact supports use of that reference in an obviousness rejection." *In re Clay*, 966 F.2d 656, 659 [23 USPQ2d 1058] (Fed. Cir. 1992).

[2] In this case, all the references for obviousness constitute analogous art, even though some of the references fall within the related field of liquid chromatography. Throughout the prosecution history of the ' 172 patent, the examiner consistently rejected elements one through six of claim 32 as obvious, citing references ranging from capillary electrophoresis to liquid chromatography – a related means of separating analytes. The examiner stated on the record: "[L]iquid chromatography and capillary electrophoresis are closely related techniques." The district court also itemized other references in the chemical separations field, describing the relation to electrophoretic separation or chromatography or both. *Princeton Biochemicals, Inc.*, 2004 WL 1398227, at *36-37. The district court further established that capillary electrophoresis is closely related to the types of electrophoreses described in some of the references. *Id.* at *37. Finally, Dr. Jorgenson offered expert testimony that one of ordinary skill in the art would look to these related fields to solve problems in the field of capillary electrophoresis. *Id.* at *37.

The district court also examined whether the prior art references were reasonably pertinent to the particular problems with which the invention of claim 32 was involved. *Id.* at *37-39. In defining such problems, the district court looked to Dr. Guzman's own testimony that the electrophoretic device needed to be compact and immobile. *Id.* at *38. As already noted, the district court properly assessed that the prior art references addressed those same problems in the same way. *Id.* at *39. In sum, the district court used proper prior art references in its correct obviousness analysis.

Viewing the evidence as a whole and in a light most favorable to Princeton, this court agrees with the district court that there was not substantial evidence to support the jury verdict. Because claim 32 is invalid for obviousness, this court need not reach the issues of prior invention and infringement.

COSTS

Each party shall bear its own costs.

AFFIRMED

- End of Case -

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47 USPQ2d 1453
In re Rouffet
U.S. Court of Appeals Federal Circuit

No. 97-1492

Decided July 15, 1998

149 F3d 1350

Headnotes

PATENTS

[1] Patentability/Validity -- Obviousness -- Combining references (► 115.0905)

Claimed low orbit satellite communications system for mobile terminals, which addresses problem of minimizing "handover" of receiver from beam footprint of one transmitting satellite to that of another through use of multiple fan-shaped beams, is not prima facie obvious over combination of three prior art references, since critical reference that teaches use of fan-shaped beam to transmit from ground station to orbiting satellites does not specifically address handover minimization, and to extent it addresses handover problem at all, does so with orbit selection rather than beam shape, and since there is no reason one of ordinary skill in art, seeking to minimize handovers due to satellite motion, would have been motivated to combine this reference with remaining references in manner that would render claimed invention obvious.

[2] Patentability/Validity -- Obviousness -- Person of ordinary skill in art (► 115.0902)

Patentability/Validity -- Obviousness -- Combining references (► 115.0905)

Three possible sources for motivation to combine prior art references in manner that would render claimed invention obvious are nature of problem to be solved, teachings of prior art, and knowledge of persons of ordinary skill in art; high level of skill in field of art cannot be relied upon to provide necessary motivation absent explanation of what specific understanding or technical principle, within knowledge one of ordinary skill in art, would have suggested combination, since, if such rote invocation could suffice to supply motivation to combine, more sophisticated scientific fields would rarely, if ever, experience patentable technical advance.

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[3] Patentability/Validity -- Obviousness -- Person of ordinary skill in art (► 115.0902)

Patentability/Validity -- Obviousness -- Combining references (► 115.0905)

Claimed low orbit satellite communications system for mobile terminals is not prima facie obvious over combination of two prior art references, even though person possessing high level of skill characteristic of this field would know to account for differences between claimed invention and prior art combination, since high level of skill in art, without more, cannot supply required motivation to combine references, and does not overcome absence of any actual suggestion to combine; obviousness rejection will not be upheld, even where skill in art is high, absent specific identification of principle, known to one of ordinary skill, that suggests claimed combination.

Case History and Disposition

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Appeal from the U.S. Patent and Trademark Office, Board of Patent Appeals and Interferences.

Patent application of Denis Rouffet, Yannick Tanguy, and Frederic Berthault, serial no. 07/888,791, filed May 27, 1992. From decision upholding examiner's final rejection of application as obvious under 35 USC 103(a), applicants appeal. Reversed.

Attorneys

Richard C. Turner and Grant K. Rowan, of Sughrue, Mion, Zinn, Macpeak & Seas, Washington, D.C., for appellants.

David J. Ball Jr., associate solicitor, Nancy J. Linck, solicitor, Albin F. Drost, deputy solicitor, Craig R. Kaufman, associate solicitor, and Scott A. Chambers, associate solicitor, U.S. Patent and Trademark Office, Arlington, Va., for appellee.

Judge

Before Plager, circuit, judge, Archer, senior circuit judge, and Rader, circuit judge.

Opinion Text

Opinion By:

Rader, J.

Denis Rouffet, Yannick Tanguy, and Frederic Berthault (collectively, Rouffet) submitted application 07/888,791 (the application) on May 27, 1992. The Board of Patent Appeals and Interferences (the Board) *affirmed* final rejection of the application as obvious under 35 U.S.C. Section 103(a). See *Ex parte Rouffet*, No. 96-1553 (Bd. Pat. App. & Int. Apr. 16, 1997). Because the Board reversibly erred in identifying a motivation to combine the references, this court reverses.

I.

Satellites in a geosynchronous or geostationary orbit remain over the same point on the Earth's surface. Their constant position above the Earth's surface facilitates communications. These satellites project a number of beams to the Earth. Each beam transmits to its area of coverage, or footprint, on the Earth's surface. In order to provide complete coverage, adjacent footprints overlap slightly and therefore must use different frequencies to avoid interference. However, two or more non-overlapping footprints can use the same set of frequencies in order to use efficiently the limited radio spectrum. Figure 1 from the application shows the coverage of a portion of the Earth's surface provided by multiple cone shaped beams:

Frequency reuse techniques, however, have a limited ability to compensate for congestion in geostationary orbits. To alleviate the orbit congestion problem, new telecommunications systems use a network of satellites in low Earth orbit. When viewed from a fixed point on the Earth's surface, such satellites do not remain stationary but move overhead. A satellite's motion as it transmits a plurality of cone-shaped beams creates a new problem. The satellite's movement causes a receiver on the Earth's surface to move from the footprint of one beam into a second beam transmitted by the same satellite. Eventually, the satellite's motion causes the receiver to move from the footprint of a beam transmitted by one satellite into the footprint of a beam transmitted by a second satellite. Each switch from one footprint to another creates a "handover" event analogous to that which occurs when a traditional cellular phone travels from one cell to another. Handovers are undesirable because

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they can cause interruptions in signal transmission and reception.

Rouffet's application discloses technology to reduce the number of handovers between beams transmitted by the same satellite. In particular, Rouffet eliminates handovers caused solely by the satellite's motion. To accomplish this goal, Rouffet changes the shape of the beam transmitted by the satellite's antenna. Rouffet's satellites transmit fan-shaped beams. A fan beam has an elliptical footprint. Rouffet aligns the long axis of his beams parallel to the direction of the satellite's motion across the Earth's surface. By elongating the beam's footprint in the direction of satellite travel, Rouffet's invention ensures that a fixed point on the Earth's surface likely will remain within a single footprint until it is necessary to switch to another satellite. Because Rouffet's invention does not address handovers caused by the motion of the receiver across the Earth's surface, his arrangement reduces, but does not eliminate, handovers. Figure 3 from the application shows the footprints 12 from six beams aligned in the direction of satellite motion 15:

The application contains ten claims that stand or fall as a group. Claim 1 is representative:

A low orbit satellite communications system for mobile terminals, wherein the communications antenna system of each satellite provides isoflux coverage made up of a plurality of fan beams that are elongate in the travel direction of the satellite.

The examiner initially rejected Rouffet's claims as unpatentable over U.S. Pat. No. 5,199,672 (King) in view of U.S. Pat. No. 4,872,015 (Rosen) and a conference report entitled "A Novel Non-Geostationary Satellite Communications System," *Conference Record*, International Conference on Communications, 1981 (Ruddy). On appeal to the Board, the examiner added an alternative ground for rejection, holding that the claims were obvious over U.S. Pat. No. 5,394,561 (Freeburg) in view of U.S. Pat. No. 5,170,485 (Levine).

On April 16, 1997, the Board issued its decision. Because Rouffet had specified that the claims would stand or fall as a group based on the patentability of claim 1, the Board limited its opinion to that claim. The Board unanimously determined that the examiner had properly rejected claim 1 as obvious over King in view of Rosen and Ruddy. The Board, on a split vote, also *affirmed* the rejection over Freeburg in view of Levine.

II

To reject claims in an application under section 103, an examiner must show an un rebutted *prima facie* case of obviousness. See *In re Deuel*, 51 F.3d 1552, 1557, 34 USPQ2d 1210, 1214 (Fed.Cir. 1995). In the absence of a proper *prima facie* case of obviousness, an applicant who complies with the other statutory requirements is entitled to a patent. See *In re Oetiker*, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed.Cir. 1992). On appeal to the Board, an applicant can overcome a rejection by showing insufficient evidence of *prima facie* obviousness or by rebutting the *prima facie* case with evidence of secondary indicia of nonobviousness. See *id.*

While this court reviews the Board's determination in light of the entire record, an applicant may specifically challenge an obviousness rejection by showing that the Board reached an incorrect conclusion of obviousness or that the Board based its obviousness determination on incorrect factual predicates. This court reviews the ultimate determination of obviousness as a question of law. See *In re Lueders*, 111 F.3d 1569, 1571, 42 USPQ2d 1481, 1482 (Fed.Cir. 1997). The factual predicates underlying an obviousness determination include the scope and content of the prior art, the differences between the prior art and the claimed invention, and the level of ordinary skill in the art. See *Monarch Knitting Mach. Corp. v. Sulzer Morat GmbH*, 139 F.3d 877, 881, 45 USPQ2d 1977, 1981 (Fed.Cir. 1998). This court reviews the Board's factual findings for clear error. See *In re Zurko*, 142 F.3d 1447, 1449, 46 USPQ2d 1691, 1693 (Fed.Cir. 1998) (in banc); *Lueders*, 111 F.3d at 1571-72. "A finding is clearly erroneous when, although there is evidence to support it, the reviewing court on the entire evidence is left with the definite and firm conviction that a mistake has been committed." *In re Graves*, 69 F.3d 1147, 1151, 36 USPQ2d

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1697, 1700 (Fed.Cir. 1995) (quoting *United States v. United States Gypsum Co.*, 333 U.S. 364, 395 [76 USPQ 430] (1948)).

The secondary considerations are also essential components of the obviousness determination. See *In re Emert*, 124 F.3d 1458, 1462, 44 USPQ2d 1149, 1153 (Fed.Cir. 1997) ("Without Emert providing rebuttal evidence, this *prima facie* case of obviousness must stand."). This objective evidence of nonobviousness includes copying, long felt but unsolved need, failure of others, see *Graham v. John Deere Co.*, 383 U.S. 1, 17-18 [148 USPQ 459] (1966), commercial success, see *In re Huang*, 100 F.3d 135, 139-40, 40 USPQ2d 1685, 1689-90 (Fed.Cir. 1996), unexpected results created by the claimed invention, unexpected properties of the claimed invention, see *In re Mayne*, 104 F.3d 1339, 1342, 41 USPQ2d 1451, 1454 (Fed.Cir. 1997); *In re Woodruff*, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936-37 (Fed.Cir. 1990), licenses showing industry respect for the invention, see *Arkie Lures, Inc. v. Gene Larew Tackle, Inc.*, 119 F.3d 953, 957, 43 USPQ2d 1294, 1297 (Fed.Cir. 1997); *Pentec, Inc. v. Graphic Controls Corp.*, 776 F.2d 309, 316, 227 USPQ 766, 771 (Fed.Cir. 1985), and skepticism of skilled artisans before the invention, see *In re Dow Chem. Co.*, 837 F.2d 469, 473, 5 USPQ2d 1529, 1532 (Fed.Cir. 1988). The Board must consider all of the applicant's evidence. See *Oetiker*, 977 F.2d at 1445 ("An observation by the Board that the examiner made a *prima facie* case is not improper, as long as the ultimate determination of patentability is made on the entire record."); *In re Piasecki*, 745 F.2d 1468, 1472, 223 USPQ 785, 788 (Fed.Cir. 1984). The court reviews factual conclusions drawn from this evidence for clear error. Whether the evidence presented suffices to rebut the *prima facie* case is part of the ultimate conclusion of obviousness and is therefore a question of law.

When a rejection depends on a combination of prior art references, there must be some teaching, suggestion, or motivation to combine the references. See *In re Geiger*, 815 F.2d 686, 688, 2 USPQ2d 1276, 1278 (Fed.Cir. 1987). Although the suggestion to combine references may flow from the nature of the problem, see

Pro-Mold & Tool Co. v. Great Lakes Plastics, Inc., 75 F.3d 1568, 1573, 37 USPQ2d 1626, 1630 (Fed.Cir. 1996), the suggestion more often comes from the teachings of the pertinent references, see *In re Sernaker*, 702 F.2d 989, 994, 217 USPQ 1, 5 (Fed.Cir. 1983), or from the ordinary knowledge of those skilled in the art that certain references are of special importance in a particular field, see *Pro-Mold*, 75 F.3d at 1573 (citing *Ashland Oil, Inc. v. Delta Resins & Refractories, Inc.*, 776 F.2d 281, 297 n.24, 227 USPQ 657, 667 n.24 (Fed.Cir. 1985)). Therefore, "[w]hen determining the patentability of a claimed invention which combines two known elements, 'the question is whether there is something in the prior art as a whole to suggest the desirability, and thus the obviousness, of making the combination.'" See *In re Beattie*, 974 F.2d 1309, 1311-12, 24 USPQ2d 1040, 1042 (Fed.Cir. 1992) (quoting *Lindemann Maschinenfabrik GmbH v. American Hoist & Derrick Co.*, 730 F.2d 1452, 1462, 221 USPQ 481, 488 (Fed.Cir. 1984)).

III

The parties agree that the five references asserted by the examiner are in the same field of endeavor as the invention. The parties also agree that the pertinent level of skill in the art -- design of satellite communications systems -- is high. On appeal, Rouffet asserts that the examiner and the Board erred by improperly combining references to render the claimed invention obvious.

The Combination of King, Rosen, and Ruddy

The Board first *affirmed* the rejection of Rouffet's claims over a combination of King, Rosen, and Ruddy. King discloses a system for launching a plurality of satellites into low Earth orbits from a single launch vehicle. Rosen teaches a geostationary satellite that uses a plurality of fan beams with their long axes oriented in an east-west direction to communicate with mobile and fixed terminals on the Earth.

The final, and most important, reference in this combination is Ruddy. Ruddy describes a television broadcast system that uses a series of satellites to retransmit signals sent from a ground station over a wide area. Rather than using a geostationary orbit, Ruddy teaches the use of a series of satellites in Molniya orbits. A satellite in a Molniya orbit always follows the same path through the sky when viewed from a fixed point on the ground. Viewed from the Earth, the orbital path includes a narrow, elliptical apogee loop. In order to transmit to these moving satellites from a ground station, Ruddy uses a fan beam with a long axis aligned with the long axis of the orbit's apogee loop. This alignment places the entire apogee loop within the footprint of the beam and eliminates the need for the ground station's antenna to track the satellite's motion around the apogee loop. Ruddy further teaches orbit parameters

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and spacing of multiple satellites to ensure that a satellite is always in the loop to receive and rebroadcast signals from the Earth station.

King and Rosen together teach the use of a network of satellites in low Earth orbit. Thus, Ruddy becomes the piece of the prior art mosaic that shows, in the reading of the Board, the use of "a plurality of fan beams that are elongate in the travel direction of the satellite." Ruddy, however, is different from the claimed invention in several respects. Specifically, the application claims the projection of multiple elliptical fan-shaped footprints from the satellite to the ground. See Claim 1, *supra*, see also Application at 6, lines 9-11 ("In addition, in this system, the geometrical shape of the beams 12 is changed: instead of being circular they are now elongate ellipses."). The application's written description further teaches that the invention's fan-shaped satellite beams will minimize handovers. See *id.* at lines 11-16 ("This considerably increases call durations between handovers.").

In contrast, Ruddy teaches that a ground station may use a single fan-shaped beam to transmit to a satellite in a unique Molniya orbit. The ground station transmits a beam into which a series of satellites in Molniya orbits will successively enter. At least two differences are evident: the application teaches projection of multiple beams from a satellite to the Earth, while Ruddy teaches projection of a single beam from the Earth to satellites. Moreover to the extent Ruddy contains a teaching about handovers, its teachings focus on use of the unique Molniya orbit to ensure that a satellite always falls within the beam transmitted by the ground station.

These differences suggest some difficulty in showing a *prima facie* case of obviousness. The Board, however, specifically found that artisans of ordinary skill in this field of art would know to shift the frame of reference from a ground station following a satellite to a satellite transmitting to the ground. According proper deference to the Board's finding of a lofty skill level for ordinary artisans in this field, this court discerns no clear error in the Board's conclusion that these differences would not preclude a finding of obviousness. While Ruddy does not expressly teach alignment of the fan beam with the apparent direction of the satellite's motion, this court perceives no clear error in the Board's determination that Ruddy would suggest such an alignment to one of skill in this art. Therefore, the Board did not err in finding that the combination of King, Rosen, and Ruddy

contains all of the elements claimed in Rouffet's application.

[1] However, the Board reversibly erred in determining that one of skill in the art would have been motivated to combine these references in a manner that rendered the claimed invention obvious. Indeed, the Board did not identify any motivation to choose these references for combination. Ruddy does not specifically address handover minimization. To the extent that Ruddy at all addresses handovers due to satellite motion, it addresses this subject through the selection of orbital parameters. Ruddy does not teach the choice of a particular shape and alignment of the beam projected by the satellite. Thus Ruddy addresses the handover problem with an orbit selection, not a beam shape. The Board provides no reasons that one of ordinary skill in this art, seeking to minimize handovers due to satellite motion, would combine Ruddy with Rosen and King in a manner that would render the claimed invention obvious.

Obviousness is determined from the vantage point of a hypothetical person having ordinary skill in the art to which the patent pertains. See 35 U.S.C. Section 103(a). This legal construct is akin to the "reasonable person" used as a reference in negligence determinations. The legal construct also presumes that all prior art references in the field of the invention are available to this hypothetical skilled artisan. See *In re Carlson*, 983 F.2d 1032, 1038, 25 USPQ2d 1207, 1211 (Fed.Cir. 1993).

As this court has stated, "virtually all [inventions] are combinations of old elements." *Environmental Designs, Ltd. v. Union Oil Co.*, 713 F.2d 693, 698, 218 USPQ 865, 870 (Fed.Cir. 1983); see also *Richdel, Inc. v. Sunspool Corp.*, 714 F.2d 1573, 1579-80, 219 USPQ 8, 12 (Fed.Cir. 1983) ("Most, if not all, inventions are combinations and mostly of old elements."). Therefore an examiner may often find every element of a claimed invention in the prior art. If identification of each claimed element in the prior art were sufficient to negate patentability, very few patents would ever issue. Furthermore, rejecting patents solely by finding prior art corollaries for the claimed elements would permit an examiner to use the claimed invention itself as a blueprint for piecing together elements in the prior art to defeat the patentability of the claimed invention. Such an approach would be "an illogical and inappropriate process by which to determine patentability." *Sensonics, Inc. v. Aerosonic Corp.*, 81 F.3d 1566, 1570, 38 USPQ2d 1551, 1554 (Fed.Cir. 1996).

To prevent the use of hindsight based on the invention to defeat patentability of the invention, this court requires the examiner to

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show a motivation to combine the references that create the case of obviousness. In other words, the examiner must show reasons that the skilled artisan, confronted with the same problems as the inventor and with no knowledge of the claimed invention, would select the elements from the cited prior art references for combination in the manner claimed.

[2] This court has identified three possible sources for a motivation to combine references: the nature of the problem to be solved, the teachings of the prior art, and the knowledge of persons of ordinary skill in the art. In this case, the Board relied upon none of these. Rather, just as it relied on the high level of skill in the art to overcome the differences between the claimed invention and the selected elements in the references, it relied upon the high level of skill in the art to provide the necessary motivation. The Board did not, however, explain what specific understanding or technological principle within the knowledge of one of ordinary skill in the art would have suggested the combination. Instead, the Board merely invoked the high level of skill in the art. If such a rote invocation could suffice to supply a motivation to combine, the more sophisticated scientific fields would rarely, if ever, experience a patentable technical advance. Instead, in complex scientific fields, the Board could routinely identify the prior art elements in an application, invoke the lofty level of skill, and rest its case for rejection. To counter this potential weakness in the obviousness construct, the suggestion to combine requirement stands as a critical safeguard against hindsight analysis and rote application of the legal test for obviousness.

Because the Board did not explain the specific understanding or principle within the knowledge of a skilled artisan that would motivate one with no knowledge of Rouffet's invention to make the combination, this court infers that the examiner selected these references with the assistance of hindsight. This court forbids the use of hindsight in the selection of references that comprise the case of obviousness. See *In re Gorman*, 933 F.2d 982, 986, 18 USPQ2d 1885, 1888 (Fed.Cir. 1991). Lacking a motivation to combine references, the Board did not show a proper *prima facie* case of obviousness. This court reverses the rejection over the combination of King, Rosen, and Ruddy.

The Combination of Freeburg and Levine

Freeburg teaches a cellular radiotelephone system based on a constellation of low Earth orbit satellites that use conical beams to transmit from the satellite to both fixed and mobile Earth stations. Levine teaches an Earth-based cellular radio system that uses fan beams broadcast from antenna towers. Levine's elliptical

footprints are aligned with the road grid. To increase the capacity of traditional ground-based systems through frequency reuse techniques, Levine teaches the use of antennas that broadcast signals with smaller footprints than the prior art system. Thus, Levine actually increases the number of overlap regions between cells and, hence, the number of potential handovers. Figure 1 of the Levine patent illustrates its alignment of beam footprints:

As a mobile unit (e.g., a driver using a car phone) moves through a succession of overlapping zones, Levine uses selection algorithms to determine which of the cells is aligned with the travel direction of the mobile unit. These algorithms then select this cell for use while continually monitoring intersecting cells in the event that the mobile unit changes direction.

Once again, this court notes significant differences between the teachings of the application and the Levine-Freeburg combination. The critical Levine reference again involves a beam from an Earth station without any reference to the "travel direction of [a] satellite." Moreover, Levine actually multiplies the number of potential handovers and then uses software to sort out the necessary handovers from the unnecessary. However, the Board explains the reasons that one possessing the lofty skills characteristic of this field would know to account for the differences between the claimed invention and the prior art combination. This court discerns no clear error in that reliance on the considerable skills in this field.

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[3] This court does, however, discern reversible error in the Board's identification of a motivation to combine Levine and Freeburg. In determining that one of skill in the art would have had motivation to combine Levine and Freeburg, the Board noted that "[t]he level of skill in the art is very high." As noted before, this observation alone cannot supply the required suggestion to combine these references. The Board posits that the high level of skill in the art overcomes the absence of any actual suggestion that one could select part of the teachings of Levine for combination with the satellite system disclosed by Freeburg.

As noted above, the suggestion to combine requirement is a safeguard against the use of hindsight combinations to negate patentability. While the skill level is a component of the inquiry for a suggestion to combine, a lofty level of skill alone does not suffice to supply a motivation to combine. Otherwise a high level of ordinary skill in an art field would almost always preclude patentable inventions. As this court has often noted, invention itself is the process of combining prior art in a nonobvious manner. *See, e.g., Richdel*, 714 F.2d at 1579; *Environmental Designs*, 713 F.2d at 698. Therefore, even when the level of skill in the art is high, the Board must identify specifically the principle, known to one of ordinary skill, that suggests the claimed combination. *Cf. Gechter v. Davidson*, 116 F.3d 1454, 43 USPQ2d 1030 (Fed.Cir. 1997) (explaining that the Board's opinion must describe the basis for its decision). In other words, the Board must explain the reasons one of ordinary skill in the art would have been motivated to select the references and to combine them to render the claimed invention obvious.

The Board's naked invocation of skill in the art to supply a suggestion to combine the references cited in this case is therefore clearly erroneous. Absent any proper motivation to combine part of Levine's teachings with Freeburg's satellite system, the rejection of Rouffet's claim over these references was improper and is reversed.

IV

The Board reversibly erred in determining that there was a motivation to combine either the teachings of King, Rosen, and Ruddy or of Freeburg and Levine in a manner that would render the claimed invention obvious. Because this predicate was missing in each case, the Board did not properly show that these references render the claimed invention obvious. Therefore this court reverses the Board's decision upholding the rejection of Rouffet's claims. In light of this disposition, Rouffet's pending motion to remand the case to the Board for further consideration is denied as moot.

COSTS

Each party shall bear its own costs.

REVERSED .

- End of Case -

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Source: USPQ, 1st Series (1929 - 1986) > U.S. Supreme Court > Graham et al. v. John Deere Company of Kansas City et al.; Calmar, Inc. v. Cook Chemical Company; Colgate-Palmolive Company v. Same, 148 USPQ 459 (U.S. 1966)

148 USPQ 459**Graham et al. v. John Deere Company of Kansas City et al.; Calmar, Inc. v. Cook
Chemical Company; Colgate-Palmolive Company v. Same
U.S. Supreme Court**

Nos. 11, 37, 43

Decided February 21, 1966

383 US 1

Headnotes**PATENTS****[1] Patentability-Invention-In general (► 51.501)**

1952 Patent Act was intended to codify judicial precedents embracing principle announced in *Hotchkiss v. Greenwood*, 11 How. 248; while clear language of section 103 places emphasis on inquiry into obviousness, general level of innovation necessary to sustain patentability remains the same.

[2] Patent grant-In general (► 50.01)

Federal patent power stems from Article I, Section 8 of Constitution, which is both a grant of power and a limitation; this qualified authority is limited to promotion of advances in useful arts; in exercise of patent power, Congress may not overreach restraints imposed by constitutional purpose, nor may it enlarge patent monopoly without regard to the innovation, advancement, or social benefit gained thereby; Congress may not authorize issuance of patents whose effects are to remove existent knowledge from public domain or to restrict free access to materials already available; innovation, advancement, and things which add to sum of useful knowledge are inherent requisites in patent system which must promote progress of useful arts; this is standard expressed in Constitution and it may not be ignored; within limits of constitutional grant, Congress may select policy which in its judgment best effectuates the constitutional aim; within scope established by Constitution, Congress may set out conditions and tests for patentability; it is duty of Commissioner of Patents and courts in administration of patent system to give effect to constitutional standard by appropriate application of statutory scheme of Congress.

[3] Patent grant-In general (► 50.01)

Underlying policy of patent system is that benefit to public from the thing patented must outweigh restrictive effect of limited patent monopoly.

[4] Patentability-Anticipation-In general (► 51.201)**Patentability-Invention-In general (► 51.501)****Patentability-Utility (► 51.75)**

Under 1952 Patent Act, patentability is dependent upon novelty, utility, and nonobviousness.

[5] Patentability-Invention-In general (► 51.501)**Patentability - Tests of - Flash of genius (► 51.705)**

Section 103 of 1952 Patent Act is a statutory expression of an additional requirement (nonobviousness) for patentability, originally expressed in *Hotchkiss v. Greenwood*, 11 How. 248; by last sentence, Congress intended to abolish test it believed Supreme Court announced in "flash of genius" phrase in *Cuno v.*

Automatic, 314 U.S. 84, 51 USPQ 272; actually, "flash of genius" was mere rhetorical restatement that requirement that subject matter sought to be patented must be beyond skill of the calling; it was the device, not the invention, that had to reveal "flash of creative genius."

[6] Patentability-Invention-In general (► 51.501)

35 U.S.C. 103 was not intended by Congress to change general level of patentable invention, but was intended merely as a codification of judicial precedents embracing the Hotchkiss (11 How. 248) condition, with congressional directions that inquiries into obviousness of subject matter sought to be patented are a prerequisite to patentability.

[7] Patentability-Invention-In general (► 51.501)

Additional condition (nonobviousness) in 35 U.S.C. 103, when followed realistically, permits a more practical test of patentability; emphasis on nonobviousness is one of inquiry, not quality, and, as such, comports with constitutional strictures.

[8] Patentability-Evidence of-Commercial success-In general (► 51.4551)

Patentability - Evidence of - Delay and failure of others to produce invention (► 51.459)

Patentability-Invention-In general (► 51.501)

Patentability - Invention - Law or fact question (► 51.507)

While ultimate question of patent validity is one of law, condition in 35 U.S.C. 103, which is but one of three conditions, each of which must be satisfied, lends itself to several basic factual inquiries; under section 103, scope and content of prior art are to be determined, differences between prior art and claims are to be ascertained, and level of ordinary skill in the pertinent art resolved; against this background, obviousness of subject matter is determined; such secondary considerations as commercial success, long felt but unsolved needs, failure of others, etc., might be utilized to give light to circumstances surrounding origin of subject matter sought to be patented; as indicia of obviousness, these inquiries may have relevancy.

[9] Abandonment-Disclosure without claiming (► 10.7)

Feature disclosed in patent drawings and specification, but not claimed therein, became public property.

[10] Patentability-Tests of-In general (► 51.701)

Patentability must be determined by consideration of subject matter sought to be patented taken as a whole.

[11] Construction of specification and claims-By Patent Office proceedings-In general (► 22.151)

Construction of specification and claims-By prior art (► 22.20)

Construction of specification and claims-Claim defines invention (► 22.30)

Invention is construed not only in light of claims, but also with reference to file wrapper or prosecution history in Patent Office; claims as allowed must be read and interpreted with reference to rejected ones and to state of prior art; claims that have been narrowed in order to obtain issuance of patent by distinguishing prior art cannot be sustained to cover that which was previously by limitation eliminated from patent.

[12] Patentability - Evidence of - Commercial success-In general (► 51.4551)

Patentability-Evidence of-Delay and failure of others to produce invention (► 51.459)

Legal inferences or subtests (long-felt need, commercial success) focus attention on economic and motivational rather than technical issues and are, therefore, more susceptible to judicial treatment than are technical facts often present in patent litigation; they may aid judiciary and may serve to guard against slipping into hindsight and to resist temptation to read into prior art the teachings of invention in

issue; however, they do not tip scales of patentability where differences from prior art were rendered apparent by prior patent before unsuccessful attempts to solve problem; it is irrelevant that no one chose to avail himself of knowledge stored in Patent Office and make a patent search.

Particular Patents

Particular patents-Plow Clamp

2,627,798, Graham, Clamp for Vibrating Shank Plows, claims 1 and 2 invalid.

2,870,943, Scoggin, Pump-Type Liquid Sprayer Having Hold-down Cap, claims 1 and 2 invalid.

Case History and Disposition

Action 1:

On writ of certiorari to Court of Appeals for the Eighth Circuit; 142 USPQ 243 .

Action by William T. Graham and

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Graham Plow, Inc., against John Deere Company of Kansas City and Deere & Company for patent infringement. On writ of certiorari to review judgment for defendants. Affirmed. See also 137 USPQ 864 , 144 USPQ 780 .

Action 2,3:

On writs of certiorari to Court of Appeals for the Eighth Circuit; 142 USPQ 412 .

Two actions against Cook Chemical Company for declaratory judgment of patent invalidity and noninfringement, one by Calmar, Inc., and one by Colgate-Palmolive Company, in which defendant counterclaims for patent infringement. On writs of certiorari to review judgments for defendant. Reversed.

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See also 138 USPQ 432 , 144 USPQ 780 .

Attorneys

Action 1: Orville O. Gold (Claude A. Fishburn on the brief) both of Kansas City, Mo., for petitioners.

S. Thomas Morris, Amarillo, Tex. (W. W. Gibson, Amarillo, Tex., and Thomas E. Scofield, Kansas City, Mo., on the brief) for respondents.

Stanton T. Lawrence, Jr., Robert E. Isner, and Charles E. McKenney, all of New York, N.Y., filed brief for New York Patent Law Association, amicus curiae.

J. Vincent Martin, Alfred H. Evans, and Russell E. Schlorff, all of Houston, Tex., filed brief for Patent, Trademark and Copyright Section of the State Bar of Texas, amicus curiae.

Roger Robb, Washington, D.C., filed brief for American Bar Association, amicus curiae.

E. Ernest Goldstein and W. Page Keeton, both of Austin, Tex., filed brief amicus curiae.

George E. Frost and James M. Wetzel, both of Chicago, Ill., filed brief for Illinois State Bar Association, amicus curiae.

Action 2,3: Dennis G. Lyons, Washington, D.C. (Victor H. Kramer, Francis G. Cole, Watson, Cole, Grindle & Watson, and Arnold, Fortas & Porter, all of Washington, D.C., George H. Mortimer, New York, N.Y., and Howard A. Crawford, Jack W.R. Headley, and Lathrop, Righter, Gordon & Parker, all of Kansas City, Mo., on the brief) for petitioners.

Gordon D. Schmidt, Kansas City, Mo. (Hovey, Schmidt, Johnson & Hovey, Carl E. Enggas, and Watson, Ess, Marshall & Enggas, all of Kansas City, Mo., and Hugh B. Cox and Charles A. Miller, both of Washington, D.C., on the brief) for respondent.

Opinion Text

After a lapse of 15 years, the Court again focuses its attention on the patentability of inventions under the

standard of Art. I, § 8, cl. 8. of the Constitution and under the conditions prescribed by the laws of the United States. Since our last expression on patent validity, *A. & P. Tea Co. v. Supermarket Corp.*, 340 U.S. 147, 87 USPQ 303 (1950), the Congress has for the first time expressly added a third statutory dimension to the two requirements of novelty and utility that had been the sole statutory test since the Patent Act of 1793. This is the test of obviousness, i.e., "whether the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made." Patent Act of 1952, 66 Stat. 798, 35 U.S.C. § 103 (1964 ed.).

[1] The questions, involved in each of the companion cases before us, are what effect did the 1952 Act have upon traditional statutory and judicial tests of patentability and what definitive tests are now required. We have concluded that the 1952 Act was intended to codify judicial precedents embracing the principle long ago announced by this Court in *Hotchkiss v. Greenwood*, 11 How. 248 (1850), and that, while the clear language of § 103 places emphasis on an inquiry into obviousness, the general level of innovation necessary to sustain patentability remains the same.

I.

The Cases (a). No. 11, *Graham v. John Deere Co.*, an infringement suit by petitioners, presents a conflict between two Circuits over the validity of a single patent on a "Clamp for vibrating Shank Plows." The invention, a combination of old mechanical elements, involves a device designed to absorb shock from plow shanks as they plow through rocky soil and thus to prevent damage to the plow. In 1955, the Fifth Circuit had held the patent valid under its rule that when a combination produces an "old result in a cheaper and otherwise more advantageous way," it is patentable. *Jeoffroy Mfg., Inc. v. Graham*, 219 F.2d 511, 104 USPQ 261, cert. denied, 350 U.S. 826, 107 USPQ 362. In 1964, the Eighth Circuit held, in the case at bar, that there was no new result in the patented combination and that the patent was,

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therefore, not valid. 333 F.2d 529, 142 USPQ 243, reversing 216 F.Supp. 272, 137 USPQ 864. We granted certiorari, 379 U.S. 956, 144 USPQ 780. Although we have determined that neither Circuit applied the correct test, we conclude that the patent is invalid under § 103 and, therefore, we affirm the judgment of the Eighth Circuit. (b). No. 37, *Calmar, Inc. v. Cook Chemical Co.*, and No. 43, *Colgate-Palmolive Co. v. Cook Chemical Co.*, both from the Eighth Circuit, were separate declaratory judgment actions, but were filed contemporaneously. Petitioner in *Calmar* is the manufacturer of a finger-operated sprayer with a "hold-down" cap of the type commonly seen on grocer's shelves inserted in bottles of insecticides and other liquids prior to shipment. Petitioner in *Colgate-Palmolive* is a purchaser of the sprayers and uses them in the distribution of its products. Each action sought a declaration of invalidity and noninfringement of a patent on similar sprayers issued to Cook Chemical as assignee of Baxter I. Scoggin, Jr., the inventor. By cross-action, Cook Chemical claimed infringement. The actions were consolidated for trial and the patent was sustained by the District Court. 220 F.Supp. 414, 138 USPQ 432. The Court of Appeals affirmed, 336 F.2d 110, 142 USPQ 412, and we granted certiorari, 380 U.S. 949. We reverse. Manifestly, the validity of each of these patents turns on the facts. The basic problems, however, are the same in each case and require initially a discussion of the constitutional and statutory provisions covering the patentability of the inventions.

II.

[2] At the outset it must be remembered that the federal patent power stems from a specific constitutional provision which authorizes the Congress "To promote the Progress of * * * useful Arts, by securing for limited Times to * * * Inventors the exclusive Right to their * * * Discoveries * * *." Art. I, § 8. ¹ The clause is both a grant of power and a limitation. This qualified authority, unlike the power often exercised in the Sixteenth and Seventeenth Centuries by the English Crown, is limited to the promotion of advances in the "useful arts." It was written against the backdrop of the practices-eventually curtailed by the Statute of Monopolies-of the Crown in granting monopolies to court favorites in goods or businesses which had long before been enjoyed by the public. See Meinhardt, *Inventions, Patents and Monopoly*, pp. 30-35 (London, 1946). The Congress in the exercise of the patent power may not overreach the restraints imposed by the stated constitutional purpose. Nor may it enlarge the patent monopoly without regard to the innovation, advancement or social benefit gained thereby. Moreover, Congress may not authorize the issuance of patents whose effects are to remove existent knowledge from the public domain, or to restrict free access to materials already available. Innovation, advancement, and things which add to the sum of useful knowledge are inherent requisites in a patent system which by constitutional command must "promote the Progress of * * * useful Arts." This is the *standard* expressed in the Constitution and it may not be ignored. And it is in this light that patent "validity" requires reference to a standard written into the Constitution." *A. & P. Tea Co. v. Supermarket Corp.*, supra, at 154, 87 USPQ at 306. Within the limits of the constitutional grant, the Congress may, of course, implement the stated purpose of the Framers by selecting the policy which in its judgment best effectuates the

constitutional aim. This is but a corollary to the grant to Congress of any Article I power. *Gibbons v. Ogden*, 9 Wheat. 1. Within the scope established by the Constitution, Congress may set out conditions and tests for patentability. *McClurg v. Kingsland*, 1 How. 202, 206. It is the duty of the Commissioner of Patents and of the courts in the administration of the patent system to give effect to the constitutional standard by appropriate application, in each case, of the statutory scheme of the Congress. Congress quickly responded to the bidding of the Constitution by enacting the Patent Act of 1790 during the second session of the First Congress. It created an agency in the Department of State headed by the Secretary of State, the Secretary of the Department of War and the Attorney General, any two of whom could issue a patent for a period not exceeding 14 years to any petitioner that "hath invented or discovered any useful art, manufacture, or device, or any improvement therein not before known or used" if the Board found that "the invention or discovery [was] sufficiently useful and important * * *." This group, whose members administered the patent system along with their

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other public duties, was known by its own designation as "Commissioners for the Production of the Useful Arts." Thomas Jefferson, who as Secretary of State was a member of the group, was its moving spirit and might well be called the "First Administrator of our Patent System." See Federico, *Operation of the Patent Act of 1790*, 18 J. P. O. S. 237, 238 (1936). He was not only an administrator of the patent system under the 1790 Act, but was also the author of the 1793 Patent Act. In addition, Jefferson was himself an inventor of great note. His unpatented improvements on plows, to mention but one of his inventions, won acclaim and recognition on both sides of the Atlantic. Because of his active interest and influence in the early development of the patent system, Jefferson's views on the general nature of the limited patent monopoly under the Constitution, as well as his conclusions as to conditions for patentability under the statutory scheme, are worthy of note. Jefferson, like other Americans, had an instinctive aversion to monopolies. It was a monopoly on tea that sparked the Revolution and Jefferson certainly did not favor an equivalent form of monopoly under the new government. His abhorrence of monopoly extended initially to patents as well. From France, he wrote to Madison urging a bill of rights provision restricting monopoly, and as against the argument that limited monopoly might serve to incite "ingenuity," he *argued* forcefully that "the benefit of even limited monopolies is too doubtful to be opposed to that of their general suppression," IV Writings of Thomas Jefferson (Ford ed.), at 476 (July 1788). His views ripened, however, and in another letter to Madison after the adoption of the Bill of Rights, Jefferson stated that he would have been pleased by an express provision in this form:

¹ The provision appears in the Constitution spliced together with the copyright provision, which we omit as not relevant here. See H.R. Rep. No. 1923, 82d Cong., 2d Sess., at 4 (1952); DeWolf, *An Outline of Copyright Law*, p. 15 (Boston 1925).

"Article 9. Monopolies may be allowed to persons for their own productions in literature, and their own inventions in the Arts, for a term not exceeding-years, but for no longer term and for no other purpose." *Id.*, at 493 (Aug. 1789).

And he later wrote:

"Certainly an inventor ought to be allowed a right to the benefit of his invention for some certain time * * *. Nobody wishes more than I do that ingenuity should receive liberal encouragement." Letter to Oliver Evans, V Writings of Thomas Jefferson, (Washington ed.), at 75 (1807). Jefferson's philosophy on the nature and purpose of the patent monopoly is expressed in a letter to Isaac McPherson, a portion of which we set out in the margin. ² He rejected a natural rights theory in intellectual property rights and clearly recognized the social and economic rationale of the patent system. The patent monopoly was not designed to secure to the inventor his natural right in his discoveries. Rather, it was a reward, an inducement, to bring forth new knowledge. The grant of an exclusive right to an invention was the creation of society-at odds with the inherent free nature of disclosed ideas-and was not to be freely given. Only inventions and discoveries which furthered human knowledge, and were new and useful, justified the special inducement of a limited private monopoly. Jefferson did not believe in granting patents for small details, obvious improvements, or frivolous devices. His writings evidence his insistence upon a high level of patentability. As a member of the patent board for several years, Jefferson saw clearly the

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difficulty in "drawing a line between things which are worth to the public the embarrassment of an exclusive patent and those which are not." The board on which he served sought to draw such a line and formulated several rules which are preserved in Jefferson's correspondence. ³ Despite the Board's efforts, Jefferson saw "with what slow progress a system of general rules could be matured." Because of the "abundance" of cases and the fact that the investigations occupied "more time of the members of the board than they could spare from their higher duties, the whole was turned over to the judiciary, to be matured into a system, under which

everyone might know when his actions were safe and lawful." Letter to McPherson, *supra*, at 181. Apparently Congress agreed with Jefferson and the Board that the courts should develop additional, conditions for patentability. Although the Patent Act was amended, revised or codified some 50 times between 1790 and 1950, Congress steered clear of a statutory set of requirements other than the bare novelty and utility tests reformulated in Jefferson's draft of the 1793 Patent Act.

² "Stable ownership is the gift of social law, and is given late in the progress of society. It would be curious, then, if an idea, the fugitive fermentation of an individual brain, could, of natural right, be claimed in exclusive and stable property. If nature has made any one thing less susceptible than all others of exclusive property, it is the action of the thinking power called an idea, which an individual may exclusively possess as long as he keeps it to himself; but the moment it is divulged, it forces itself into the possession of every one, and the receiver cannot dispossess himself of it. Its peculiar character, too, is that no one possesses the less, because every other possesses the whole of it. He who receives an idea from me, receives instruction himself without lessening mine; as he who lights his taper at mine, receives light without darkening mine. That ideas should freely spread from one to another over the globe, for the moral and mutual instruction of man, and improvement of his condition, seems to have been peculiarly and benevolently designed by nature. When she made them like fire, expansible over all space, without lessening their density in any point, and like the air in which we breathe, move, and have our physical being, incapable of confinement or exclusive appropriation. Inventions then cannot, in nature, be a subject of property. Society may give an exclusive right to the profits arising from them, as an encouragement to men to pursue ideas which may produce utility, but this may or may not be done according to the will and convenience of the society, without claim or complaint from anybody." VI Writings of Thomas Jefferson (Washington ed.), at 180 (1814).

³ "A machine of which we are possessed might be applied by every man to any use of which it is susceptible." Letter to Isaac McPherson, *supra*, at 181.

"A change of material should not give title to a patent. As the making a plowshare of cast rather than of wrought iron; a comb of iron instead of horn or ivory * * *." *Ibid*.

"A mere change of form should give no right to a patent, as a high quartered shoe instead of a low one; a round hat instead of a three square, or a square bucket instead of a round one." *Id.*, at 182.

"[A combined use of old implements] A man has the right to use a saw, an axe, a plane separately; may he not combine their uses on the same piece of wood?" Letter to Oliver Evans, *supra*, at 298.

III.

[3] The difficulty of formulating conditions for patentability was heightened by the generality of the constitutional grant and the statutes implementing it, together with the underlying policy of the patent system that "the things which are worth to the public the embarrassment of an exclusive patent," as Jefferson put it, must outweigh the restrictive effect of the limited patent monopoly. The inherent problem was to develop some means of weeding out those inventions which would not be disclosed or devised but for the inducement of a patent. This Court formulated a general condition of patentability in 1850 in *Hotchkiss v. Greenwood*, 11 How. 248. The patent involved a mere substitution of materials-porcelain or clay for wood or metal in door knobs-and the Court condemned it, holding: ⁴

⁴ In historical retrospect, the specific result in *Hotchkiss* flows directly from an application of one of the rules of the original board of "Commissioners," n. 3, second rule, *supra*.

"[U]nless more ingenuity and skill * * * were required than were possessed by an ordinary mechanic acquainted with the business, there was an absence of that degree of skill and ingenuity which constitute essential elements of every invention. In other words, the improvement is the work of a skilled mechanic, not that of the inventor." At p. 267. *Hotchkiss*, by positing the condition that a patentable invention evidence more ingenuity and skill than that possessed by an ordinary mechanic acquainted with the business, merely distinguished between new and useful innovations that were capable of sustaining a patent and those that were not. The *Hotchkiss* test laid the cornerstone of the judicial evolution suggested by Jefferson and left to the courts by Congress. The language in the case, and in those which followed, gave birth to "invention" as a word of legal art signifying patentable inventions. Yet, as this Court has observed, "[t]he truth is the word ['invention'] cannot be defined in such a manner as to afford any substantial aid in determining whether a particular device involves an exercise of inventive faculty or not." *McClain v. Ortmyer*, 141 U.S. 419, 427 (1891), *A. & P. Tea Co. v. Supermarket Corp.*, 340 U.S. at 151, 87 USPQ at 305. Its use as a label brought about a large variety of opinions as to its meaning both in the Patent Office, in the courts, and at the bar. The *Hotchkiss* formulation, however, lies not in any label, but in its functional approach to questions of patentability. In practice, *Hotchkiss* has required a comparison between the subject matter of the patent, or patent application, and the background skill of the calling. It has been from this comparison that patentability

was in each case determined.

IV.

The 1952 Act .

[4] The Act sets out the conditions of patentability in three sections. An analysis of the structure of these three sections indicates that patentability is

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dependent upon three explicit conditions: novelty and utility as articulated and defined in § 101, and § 102, and nonobviousness, the new statutory formulation, as set out in § 103. The first two sections, which trace closely the 1874 codification, express the "new and useful" tests which have always existed in the statutory scheme and, for our purposes here, need no clarification.⁵ The pivotal section around which the present controversy centers is § 103. It provides:

⁵ "§ 101. Inventions patentable

"Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title."

"§ 102. Conditions for patentability; novelty and loss of right to patent

"A person shall be entitled to a patent unless-

"(a) The invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for patent, or

"(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of the application for patent in the United States, or

"(c) he has abandoned the invention, or

"(d) the invention was first patented or caused to be patented by the applicant or his legal representatives or assigns in a foreign country prior to the date of the application for patent in this country on an application filed more than twelve months before the filing of the application in the United States, or

"(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or

"(f) he did not himself invent the subject matter sought to be patented, or

"(g) before the applicant's invention thereof the invention was made in this country by another who had not abandoned, suppressed, or concealed it. In determining priority of invention there shall be considered not only the respective dates of conception and reduction to practice of the invention, but also the reasonable diligence of one who was first to conceive and last to reduce to practice, from a time prior to conception by the other."

The precursors of these sections are to be found in Act of February 21, 1793, c. 11, 1 Stat. 318; Act of July 4, 1836, c. 357, 5 Stat. 117; Act of July 8, 1870, c. 230, 16 Stat. 198; Rev. Stat. (1874) § 4886.

"§ 103. Conditions for patentability; non-obvious subject matter

"A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made." The section is cast in relatively unambiguous terms. Patentability is to depend, in addition to novelty and utility, upon the "non-obvious" nature of the "subject matter sought to be patented" to a person having ordinary skill in the pertinent art. The first sentence of this section is strongly reminiscent of the language in *Hotchkiss*. Both formulations place emphasis on the pertinent art existing at the time the invention was made and both are implicitly tied to advances in that art. The major distinction is that Congress has emphasized "non-obviousness" as the operative test of the section, rather than the less definite "invention" language of *Hotchkiss* that Congress thought had lead to "a large variety" of expressions in decisions and writings. In the title itself the Congress used the phrase "Conditions for patentability: *non-obvious subject matter*," thus focusing upon "non-obviousness" rather than "invention."⁶ The Senate and House Reports, S. Rep. No. 1979, 82d Cong., 2d Sess. (1952); H.R. Rep. No. 1923, 82d Cong., 2d Sess. (1952), reflect this emphasis in these terms:.

⁶ The corresponding provision in the preliminary draft was titled "Conditions for Patentability; *lack of invention*," Proposed Revision and Amendment of the Patent Laws, Preliminary Draft with Notes of House

"Section 103, for the first time in our statute, provides a condition which exists in the law and has existed for more than 100 years, but only by reason of decision of the Courts. An invention which has been made, and which is new in the sense that the same thing has not been made before, may still not be patentable if the difference between the new thing and what was known before is not considered sufficiently great to warrant a patent. That has been expressed in a large variety of ways in decisions of the courts and in writings. Section 103 states this requirement in the title. It refers to the difference between the subject matter sought to be patented and the prior art, meaning

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what was known before as described in section 102. If this difference is such that the subject matter as a whole would have been obvious at the time to a person skilled in the art, then the subject matter cannot be patented.

"That provision paraphrases language which has often been used in decisions of the courts, and the section is added to the statute for uniformity and definiteness. This section should have a stabilizing effect and minimize great departures which have appeared in some cases." H.R. Rep., at 7; S. Rep., at 6.

[5] It is undisputed that this section was, for the first time, a statutory expression of an additional requirement for patentability, originally expressed in *Hotchkiss*. It also seems apparent that Congress intended by the last sentence of § 103 to abolish the test it believed this Court announced in the controversial phrase "flash of genius," used in *Cuno Corp. v. Automatic Devices Corp.*, 314 U.S. 84, 51 USPQ 272 (1941).⁷ It is contended, however, by some of the parties and by several of the amici that the first sentence of § 103 was intended to sweep away judicial precedents and to lower the level of patentability. Others contend that the Congress intended to codify the essential purpose reflected in existing judicial precedents—the rejection of insignificant variations and innovations of a commonplace sort—and also to focus inquiries under § 103 upon nonobviousness, rather than upon "invention," as a means of achieving more stability and predictability in determining patentability and validity. The Reviser's Note to this section,⁸ with apparent reference to *Hotchkiss*, recognizes that judicial requirements as to "lack of patentable novelty have been followed since at least as early as 1850." The note indicates that the section was inserted because it "may have some stabilizing effect and also serve as a basis for the addition at a later time of criteria which may be worked out." To this same effect are the reports of both Houses, *supra*, which state that the first sentence of the section "paraphrases the language which has often been used in decisions of the courts and the section is added to the statute for uniformity and definiteness."

⁷ The sentence in which the phrase occurs reads: "The new device, however useful it may be, must reveal the flash of creative genius, not merely the skill of the calling." At p. 91, 51 USPQ at 275. Although some writers and lower courts found in the language connotations as to the frame of mind of the inventors, none were so intended. The opinion approved *Hotchkiss* specifically, and the reference to "flash of creative genius" was but a rhetorical embellishment of language going back to 1833. Cf. "exercise of genius," *Shaw v. Cooper*, 7 Pet. 292; "inventive genius," *Rickendorfer v. Farber*, 92 U.S. 347 (1875); *Concrete Appliance Products Co.*; "flash or thought," *Densmore v. Scofield*, 102 U.S. 375 (1880); "intuitive genius," *C. A. Potts Co. v. Creager*, 155 U.S. 597 (1895). Rather than a more exacting standard, *Cuno* merely rhetorically restated the requirement that the subject matter sought to be patented must be beyond the skill of the calling. It was the device, not the invention, that had to reveal the "flash of creative genius." See *Boyajian, The Flash of Creative Genius*, 25 J.P.O.S. 776, 780, 781 (1943); *Pacific Contact Laboratories, Inc. v. Solex Laboratories, Inc.*, 209 F.2d 529, 533, 100 USPQ 12, 12; *Brown & Sharpe Mfg. Co., v. Kar Engineering Co.*, 154 F.2d 48, 51-52, 68 USPQ 427, 427; *In re Shortell*, 142 F.2d 292, 295-296, 61 USPQ 362, 366-367.

⁸ "There is no provision corresponding to the first sentence explicitly stated in the present statutes, but the refusal of patents by the Patent Office, and the holding of patents invalid by the courts, on the ground of lack of invention or lack of patentable novelty has been followed since at least as early as 1850. This paragraph is added with the view that an explicit statement in the statute may have some stabilizing effect, and also to serve as a basis for the addition at a later time of some criteria which may be worked out.

"The second sentence states that patentability as to this requirement is not to be negated by the manner in which the invention was made, that is, it is immaterial whether it resulted from long toil and experimentation or from a flash of genius."

[6] We believe that this legislative history, as well as other sources,⁹ show that the revision was not intended by Congress to change the general level of patentable invention. We conclude that the section was

intended merely as a codification of judicial precedents embracing the Hotchkiss condition, with congressional directions that inquiries into the obviousness of the subject matter sought to be patented are a prerequisite to patentability.

⁹ See Efforts to Establish a Statutory Standard of Invention, Study No. 7, Senate Subcommittee on Patents, Trademarks and Copyrights, 85th Cong., 2d Sess. (Committee Print, 1961); Hearings, Subcommittee No. 3, House Committee on the Judiciary, on H.R. 3760, 82d Cong., 1st Sess. (1951).

V.

[7] Approached in this light, the § 103 additional condition, when fol

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lowed realistically, will permit a more practical test of patentability. The emphasis on nonobviousness is one of inquiry, not quality and, as such, comports with the constitutional strictures.

[8] While the ultimate question of patent validity is one of law, *A. & P. Tea Co. v. Supermarket Corp.*, supra, at 155, 87 USPQ at 307, the § 103 condition, which is but one of three conditions, each of which must be satisfied, lends itself to several basic factual inquiries. Under § 103, the scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved. Against this background, the obviousness or nonobviousness of the subject matter is determined. Such secondary considerations as commercial success, long felt but unsolved needs, failure of others, etc., might be utilized to give light to the circumstances surrounding the origin of the subject matter sought to be patented. As indicia of obviousness or nonobviousness, these inquiries may have relevancy. See Note, Subtests of "Nonobviousness," 112 U. Pa. L.Rev. 1169 (1964). This is not to say, however, that there will not be difficulties in applying the nonobviousness test. What is obvious is not a question upon which there is likely to be uniformity of thought in every given factual context. The difficulties, however, are comparable to those encountered daily by the courts in such frames of reference as negligence and scienter, and should be amenable to a case-by-case development. We believe that strict observance of the requirements laid down here will result in that uniformity and definitiveness which Congress called for in the 1952 Act. While we have focused attention on the appropriate standard to be applied by the courts, it must be remembered that the primary responsibility for sifting out unpatentable material lies in the Patent Office. To await litigation is-for all practical purposes-to debilitate the patent system. We have observed a notorious difference between the standards applied by the Patent Office and by the courts. While many reasons can be adduced to explain the discrepancy, one may well be the free rein often exercised by examiners in their use of the concept of "invention." In this connection we note that the Patent Office is confronted with a most difficult task. Almost 100,000 applications for patents are filed each year. Of these, about 50,000 are granted with the result that the backlog now runs well over 200,000. United States Patent Office, Index of Patents, p. 1123 (1963). This is itself a compelling reason for the Commissioner to strictly adhere to the 1952 Act as interpreted here. This would we believe, not only expedite disposition but bring about a closer concurrence between administrative and judicial precedent.¹⁰ Although we conclude here that the inquiry which the Patent Office and the courts must make as to patentability must be beamed with greater intensity on the requirements of § 103, it bears repeating that we find no change in the general strictness with which the overall test is to be applied. We have been urged to find in § 103 a relaxed standard, supposedly a congressional reaction to the "increased standard" applied by this Court in its decisions over the last 20 or 30 years. The standard has remained invariable in this Court. Technology, however, has advanced-and with remarkable rapidity in the last 50 years. Moreover the ambit of applicable art in given fields of science has widened by disciplines unheard of a half-century ago. It is but an evenhanded application to require those persons granted the benefit of a patent monopoly be charged with an awareness of these changed conditions. The same is true of the less technical, but still useful arts. He who seeks to build a better mousetrap today has a long path to tread before reaching the Patent Office.

¹⁰ The President has appointed a Commission on the Patent System. Executive Order No. 11215, 30 Fed.Reg. 4661 (April 10, 1965). It is hoped that its studies may develop more efficient administrative procedures and techniques that will further expedite dispositions and at the same time insure the strict application of appropriate tests of patentability.

VI. We now turn to the application of the conditions found necessary for patentability to the cases involved here:

A. The patent in issue in No. 11, *Graham v. John Deere Co.* This patent, No. 2,627,798 (hereinafter called the '798 patent) relates to a spring clamp which permits plow shanks to be pushed upward when they hit obstructions in the soil, and then springs the shanks back into normal position when the obstruction is passed

over. The device, which we show diagrammatically in the accompanying sketches (Appendix, Fig. 1), is fixed to the plow frame as a unit. The mechanism around which the controversy centers is basically a hinge. The top

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half of it, known as the upper plate (marked 1 in the sketches), is a heavy metal piece clamped to the plow frame (2) and is stationary relative to the plow frame. The lower half of the hinge, known as the hinge plate (3), is connected to the rear of the upper plate by a hinge pin (4) and rotates downward with respect to it. The shank (5), which is bolted to the forward end of the hinge plate (at 6), runs beneath the plate and parallel to it for about nine inches, passes through a stirrup (7), and then continues backward for several feet curving down toward the ground. The chisel (8), which does the actual plowing, is attached to the rear end of the shank. As the plow frame is pulled forward, the chisel rips through the soil, thereby plowing it. In the normal position, the hinge plate and the shank are kept tight against the upper plate by a spring (9), which is atop the upper plate. A rod (10) runs through the center of the spring, extending down through holes in both plates and the shank. Its upper end is bolted to the top of the spring while its lower end is hooked against the underside of the shank. When the chisel hits a rock or other obstruction in the soil, the obstruction forces the chisel and the rear portion of the shank to move upward. The shank is pivoted (at 11) against the rear of the hinge plate and pries open the hinge against the closing tendency of the spring. (See sketch labeled "Open Position," Appendix, Fig. 1.). This closing tendency is caused by the fact that, as the hinge is opened, the connecting rod is pulled downward and the spring is compressed. When the obstruction is passed over, the upward force on the chisel disappears and the spring pulls the shank and hinge plate back into their original position. The lower, rear portion of the hinge plate is constructed in the form of a stirrup (6) which brackets the shank, passing around and beneath it. The shank fits loosely into the stirrup (permitting a slight up and down play). The stirrup is designed to prevent the shank from recoiling away from the hinge plate, and thus prevents excessive strain on the shank near its bolted connection. The stirrup also girds the shank, preventing it from fishtailing from side to side. In practical use, a number of spring-hinge-shank combinations are clamped to a plow frame, forming a set of ground-working chisels capable of withstanding the shock of rocks and other obstructions in the soil without breaking the shanks.

Background of the Patent . Chisel plows, as they are called, were developed for plowing in areas where the ground is relatively free from rocks or stones. Originally, the shanks were rigidly attached to the plow frames. When such plows were used in the rocky glacial soils of some of the Northern States, they were found to have serious defects. As the chisels hit buried rocks, a vibratory motion was set up and tremendous forces were transmitted to the shank near its connection to the frame. The shanks would break. Graham, one of the petitioners, sought to meet that problem, and in 1950 obtained a patent, U.S. No. 2,493,811, on a spring clamp which solved some of the difficulties. Graham and his companies manufactured and sold the '811 clamps. In 1950, Graham *modified* the '811 structure and filed for a patent. That patent, the one in issue, was granted in 1953. This suit against competing plow manufacturers resulted from charges by petitioners that several of respondents' devices infringed the '798 patent.

The Prior Art . Five prior patents indicating the state of the art were cited by the Patent Office in the prosecution of the '798 application. Four of these patents, 10 other United States patents and two prior use spring clamp arrangements not of record in the '798 file wrapper were relied upon by respondent as revealing the prior art. The District Court and the Court of Appeals found that the prior art "as a whole in one form or another contains all of the mechanical elements of the '798 Patent." One of the prior use clamp devices not before the Patent Examiner-Glencoe-was found to have "all of the elements." We confine our discussion to the prior patent of Graham, '811, and to the Glencoe clamp device, both among the references asserted by respondents. The Graham '811 and '798 patent devices are similar in all elements, save two; (1) the stirrup and the bolted connection of the shank to the hinge plate do not appear in '811; and (2) the position of the shank is *reversed*, being placed in patent '811 above the hinge plate, sandwiched between it and the upper plate. The shank is held in place by the spring rod which is hooked against the bottom of the hinge plate passing through a slot in the shank. Other differences are of no consequence to our examination. In practice the '811 patent arrangement permitted the shank to wobble or fishtail because it was not rigidly fixed to the hinge plate; moreover, as the hinge plate was below the

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shank, the latter caused wear on the upper plate, a member difficult to repair or replace. Graham's '798 patent application contained 12 claims. All were rejected as not distinguished from the Graham '811 patent. The inverted relationship of the shank was specifically rejected as was the bolting of the shank to the hinge plate. The Patent Office examiner found these to be "matters of design well within the expected skill of the art and devoid of invention." Graham withdrew the original claims and substituted the two new ones which are substantially those in issue here. His contention was that wear was reduced in patent '798 between the shank and the heel or rear of the upper plate. ¹¹ He also emphasized several new features, the relevant one here

being that the bolt used to connect the hinge plate and shank maintained the upper face of the shank in continuing and constant contact with the underface of the hinge plate. Graham did not urge before the Patent Office the greater "flexing" qualities of the '798 patent arrangement which he so heavily relied on in the courts. The sole element in patent '798 which petitioners argue before us is the interchanging of the shank and hinge plate and the consequences flowing from this arrangement. The contention is that this arrangement - which petitioners claim is not disclosed in the prior art - permits the shank to flex under stress for its *entire* length. As we have sketched (see sketch, "Graham '798 Patent" in Appendix, Fig. 2), when the chisel hits an obstruction the resultant force (A) pushes the rear of the shank upward and the shank pivots at the underface of the upper plate at its rear (C). The natural tendency is for that portion of the shank between the pivot point and the bolted connection (i.e., between C and D) to bow downward and away from the hinge plate. The maximum distance (B) that the shank moves away from the plate is slight - for emphasis, greatly exaggerated in the sketches. This is so because of the strength of shank and the short-nine inches or so-length of that portion of the shank between (C) and (D). On the contrary, in patent '811 (see sketch, "Graham '811 Patent" in Appendix, Fig. 2), the pivot points is the upper plate at point (c); and while the tendency for the shank to bow between points (c) and (d) is the same as in '798, the shank is restricted because of the underlying hinge and cannot flex as freely. In practical effect, the shank flexes only between points (a) and (c), and not along the entire length of the shank, as in '798. Petitioners say that this difference in flex, though small, effectively absorbs the tremendous forces of the shock of obstructions whereas prior art arrangements failed.

¹¹ In '811, where the shank was above the hinge plate, an upward movement of the chisel forced the shank up against the underside of the rear of the upper plate. The upper plate thus acted as the fulcrum about which the hinge was pried open. Because of this, as well as the location of the hinge pin, the shank rubbed against the heel of the upper plate causing wear both to the plate and to the shank. By relocating the hinge pin and by placing the hinge plate between the shank and the upper plate, as in '798, the rubbing was eliminated and the wear point was changed to the hinge plate, a member more easily removed or replaced for repair.

The Obviousness of the Differences . We cannot agree with petitioners. We assume that the prior art does not disclose such an arrangement as petitioners claim in patent '798. Still we do not believe that the argument on which petitioners' contention is bottomed supports the validity of the patent. The tendency of the shank to flex is the same in all cases. If free-flexing, as petitioners now argue, is the crucial difference above the prior art, then it appears evident that the desired result would be obtainable by not boxing the shank within the confines of the hinge. ¹² The only other effective place available in the arrangement was to attach it below the hinge plate and run it through a stirrup or bracket that would not disturb its flexing qualities. Certainly a person having ordinary skill in the prior art, given the fact that the flex in the shank could be utilized more effectively if allowed to run the entire length of the shank, would immediately see that the thing to do was what Graham did, i.e., invert the shank and the hinge plate. Petitioners' argument basing validity on the free-flex theory raised for the first time on appeal is reminiscent of *Lincoln Engineering Co. v. Stewart-Warner Corp.*, 303 U.S. 545, 37 USPQ 1, 3 (1938), where the Court called such

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an effort "an afterthought. No such function * * * is hinted at in the specifications of the patent. If this were so vital an element in the functioning of the apparatus it is strange that all mention of it was omitted." At p. 550, 37 USPQ at 3. No "flexing" argument was raised in the Patent Office. Indeed, the trial judge specifically found that "flexing is not a claim of the patent in suit * * *" and would not permit interrogation as to flexing in the accused devices. Moreover, the clear testimony of petitioners' experts shows that the flexible advantages flowing from the '798 arrangement are not, in fact, a significant feature in the patent. ¹³ We find no nonobvious facets in the '798 arrangement. The wear and repair claims were sufficient to overcome the patent examiner's original conclusions as to the validity of the patent. However, some of the prior art, notably *Glencoe*, was not before him. There the hinge plate is below the shank but, as the courts below found, all of the elements in the '798 patent are present in the *Glencoe* structure. Furthermore, even though the position of the shank and hinge plate appears *reversed* in *Glencoe*, the mechanical operation is identical. The shank there pivots about the underside of the stirrup, which in *Glencoe* is *above* the shank. In other words, the stirrup in *Glencoe* serves exactly the same function as the heel of the hinge plate in '798. The mere shifting of the wear point to the heel of the '798 hinge plate from the stirrup of *Glencoe*-itself a part of the hinge plate-presents no operative mechanical distinctions, much less nonobvious differences.

¹² Even petitioners' expert testified to that effect:

"Q. Given the same length of the forward portion of the clamp * * * you would anticipate that the magnitude of flex [in '798] would be precisely the same or substantially the same as in '811, wouldn't you?

"A. I would think so."

¹³ "Q. * * * Do you regard the small degree of flex in the forward end of the shank that lies between the pivot point and the point of spring attachment to be of any significance or any importance to the functioning of a device such as 798? A. Unless you are approaching the elastic limit, I think this flexing will reduce the maximum stress at the point of pivot there, where the maximum stress does occur. I think it will reduce that. I don't know how much.

"Q. Do you think it is a substantial factor, a factor of importance in the functioning of the structure? A. Not a great factor, no."

The same expert previously testified similarly in *Jeoffroy*, supra.

B. The Patent in issue in No. 37, *Calmar, Inc. v. Cook Chemical Co.* and in No. 43, *Colgate Palmolive Co. v. Cook Chemical Co.* The single patent ¹⁴ involved in these cases relates to a plastic finger sprayer with a "hold down" lid used as a built-in dispenser for containers or bottles packaging liquid products, principally household insecticides. Only the first two of the four claims in the patent are involved here and we, therefore, limit our discussion to them. We do not set out those claims here since they are printed in 220 F.Supp., at pp. 417-418, 138 USPQ at 435. In essence the device here combines a finger-operated pump sprayer, mounted in a container or bottle by means of a container cap, with a plastic overcap which screws over the top of and depresses the sprayer (see Figure 3 in the Appendix). The pump sprayer passes through the container cap and extends down into the liquid in the container; the overcap fits over the pump sprayer and screws down on the outside of the collar mounting or retainer which is molded around the body of the sprayer. When the overcap is screwed down on this collar mounting a seal is formed by the engagement of a circular ridge or rib located above the threads on the collar mounting with a mating shoulder located inside the overcap above its threads. ¹⁵ The overcap, as it is screwed down, depresses the pump plunger rendering the pump inoperable and when the seal is effected, any liquid which might seep into the overcap through or around the pump is prevented from leaking out of the overcap. The overcap serves also to protect the sprayer head and prevent damage to it during shipment or merchandising. When the overcap is in place it does not reach the cap of the container or bottle and in no way engages it since a slight space is left between those two pieces. The device, called a shipper-sprayer in the industry, is sold as an integrated unit with the overcap in place enabling the insecticide manufacturer to install it on the container or bottle of liquid in a single operation in an automated bottling process. The ultimate consumer simply unscrews and discards the overcap, the pump plunger springs up and the sprayer is ready for use.

¹⁴ The patent is U.S. No. 2,870,943 issued in 1959 to Cook Chemical Co. as assignee of Burton I. Scoggin, Jr., the inventor. In No. 37 *Calmar* is the manufacturer of an alleged infringing device, and, in No. 43, *Colgate* is a purchaser of *Calmar* and user of its device.

¹⁵ Our discussion here relates to the overcap seal. The container itself is sealed in the customary way through the use of a container gasket located between the container and the container cap.

The Background of the Patent . For many years manufacturers engaged in the insecticide business had

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faced a serious problem in developing sprayers that could be integrated with the containers or bottles in which the insecticides were marketed. Originally, insecticides were applied through the use of tin sprayers, not supplied by the manufacturer. In 1947, Cook Chemical, an insecticide manufacturer, began to furnish its customers with plastic pump dispensers purchased from Calmar. The dispenser was an unpatented finger-operated device mounted in a perforated cardboard holder and hung over the neck of the bottle or container. It was necessary for the ultimate consumer to remove the cap of the container and insert and attach the sprayer to the latter for use. Hanging the sprayer on the side of the container or bottle was both expensive and troublesome. Packaging for shipment had to be a hand operation, and breakage and pilferage as well as the loss of the sprayer during shipment and retail display often occurred. Cook Chemical urged Calmar to develop an integrated sprayer that could be mounted directly in a container or bottle during the automated filling process and that would not leak during shipment or retail handling. Calmar did develop some such devices but for various reasons they were not completely successful. The situation was aggravated in 1954 by the entry of Colgate-Palmolive into the insecticide trade with its product marketed in aerosol spray cans. These containers, which used compressed gas as a propellant to dispense the liquid, did not require pump sprayers. During the same year Calmar was acquired by the Drackett Company. Cook Chemical became apprehensive of its source of supply for pump sprayers and decided to manufacture its own through a subsidiary, Bakan Plastics, Inc. Initially, it copied its design from the unpatented Calmar sprayer, but an officer of Cook Chemical, Scoggin, was assigned to develop a more efficient device. By 1956 Scoggin had perfected the shipper-sprayer in suit and a patent was granted in 1959 to Cook Chemical as his assignee. In the interim Cook Chemical began to use Scoggin's device and it was also marketed to the trade. The device

was well received and soon became widely used. In the meanwhile, Calmar employed two engineers, Corsett and Coopridge, to perfect a shipper-sprayer and by 1958 it began to market its SS-40, a device very much similar to Scoggin's. When the Scoggin patent issued, Cook Chemical charged Calmar's SS-40 with infringement and this suit followed.

The Opinions of the District Court and the Court of Appeals. At the outset it is well to point up that the parties have always disagreed as to the scope and definition of the invention claimed in the patent in suit. Cook Chemical contends that the invention encompasses a unique combination of admittedly old elements and that patentability is found in the result produced. Its expert testified that the invention was "the first commercially successful, inexpensive, integrated shipping closure pump unit which permitted automated assembly with a container of household insecticide or similar liquids to produce a practical ready-to-use package which should be shipped without external leakage and which was so organized that the pump unit with its hold-down cap could be itself assembled and sealed and then later assembled and sealed on the container without breaking the first seal." Cook Chemical stresses the long-felt need in the industry for such a device; the inability of others to produce it; and its commercial success—all of which, contends Cook, evidences the nonobvious nature of the device at the time it was developed. On the other hand, Calmar says that the differences between Scoggin's shipper-sprayer and the prior art relate only to the design of the overcap and that the differences are so inconsequential that the device as a whole would have been obvious at the time of its invention to a person having ordinary skill in the art. Both courts accepted Cook Chemical's contentions. While the exact basis of the District Court's holding is uncertain, it did find the subject matter of the patent new, useful and nonobvious. It concluded that Scoggin "had produced a sealed and protected sprayer unit which the manufacturer need only screw onto the top of its container much in the same fashion as a simple cap." 220 F.Supp. at 418, 138 USPQ at 436. Its decision seems to be bottomed on the finding that the Scoggin sprayer solved the long-standing problem that had confronted the industry. ¹⁶ The Court of Appeals also found validity in the

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"novel 'marriage' of the sprayer with the insecticide container" which took years in discovery and in "the immediate commercial success" which it enjoyed. While finding that the individual elements of the invention were "not novel per se" the court found "nothing in the prior art suggesting Scoggin's unique combination of these old features as would solve the problem * * * which for years beset the insecticide industry." It concluded that "the * * * [device] * * * meets the exacting standard required for a combination of old elements to rise to the level of patentable invention by fulfilling the long-felt need with an economical, efficient, utilitarian apparatus which achieved novel results and immediate commercial success." 336 F.2d at 114, 142 USPQ at 415.

¹⁶ "By the same reasoning, may it not also be said that if [the device] solved a long-sought need, it was likewise novel? If it meets the requirements of being new, novel, and useful, it was the subject of invention, although it may have been a short step, nevertheless it was the last step that ended the journey. The last step is the one that wins and he who takes it when others could not, is entitled to patent protection." 220 F.Supp. at 421, 138 USPQ at 438.

The Prior Art. Only two of the five prior art patents cited by the Patent Office Examiner in the prosecution of Scoggin's application are necessary to our discussion, i.e., Lohse U.S. Patent No. 2,119,884 (1938) and Mellon U.S. Patent No. 2,586,687 (1952). Others are cited by Calmar that were not before the examiner, but of these our purposes require discussion only of the Livingstone U.S. Patent No. 2,751,480 (1953). Simplified drawings of each of these patents are reproduced in the Appendix, Figs. 4-6 for comparison and description. The Lohse patent (Fig. 4) is a shipper-sprayer designed to perform the same function as Scoggin's device. The differences, recognized by the District Court, are found in the overcap seal which in Lohse is formed by the skirt of the overcap engaging a washer or gasket which rests upon the upper surface of the container cap. The court emphasized that in Lohse "there are no seals above the threads and below the sprayer head." 220 F.Supp. at 419-420, 138 USPQ at 437. The Mellon patent (Fig. 5), however, discloses the idea of effecting a seal above the threads of the overcap. Mellon's device, likewise a shipper-sprayer, differs from Scoggin's in that its overcap screws directly on the container, and a gasket, rather than a rib, is used to effect the seal. Finally, Livingstone (Fig. 6) shows a seal above the threads accomplished without the use of a gasket or washer. ¹⁷ Although Livingstone's arrangement was designed to cover and protect pouring spouts, his sealing feature is strikingly similar to Scoggin's. Livingstone uses a tongue and groove technique in which the tongue, located on the upper surface of the collar, fits into a groove on the inside of the overcap. Scoggin employed the rib and shoulder seal in the identical position and with less efficiency because the Livingstone technique is inherently a more stable structure, forming an interlock that withstands distortion of the overcap when subjected to rough handling. Indeed, Cook Chemical has now incorporated the Livingstone closure into its own shipper-sprayers as had Calmar in its SS-40.

¹⁷ [9] While the sealing feature was not specifically claimed in the Livingstone patent, it was disclosed in the drawings and specifications. Under long-settled law the feature became public property. *Miller v. Brass Company*, 104 U.S. 350, 352 (1881).

The Invalidity of the Patent .

[10] Let us first return to the fundamental disagreement between the parties. Cook Chemical, as we noted at the outset, urges that the invention must be viewed as the overall combination, or-putting it in the language of the statute-that we must consider the subject matter sought to be patented taken as a whole. With this position, taken in the abstract there is of course no quibble. But the history of the prosecution of the Scoggin application in the Patent Office reveals a substantial divergence in respondent's present position. As originally submitted, the Scoggin application contained 15 claims which in very broad terms claimed the entire combination of spray pump and overcap. No mention of, or claim for, the sealing features were made. All 15 claims were rejected by the examiner because (1) the applicant was vague and indefinite as to what the invention was, and (2) the claims were met by Lohse. Scoggin canceled these claims and submitted new ones. Upon a further series of rejections and new submissions, the Patent Office Examiner, after an office interview, at last relented. It is crystal-clear that after the first rejection, Scoggin relied entirely upon the sealing arrangement as the exclusive patentable difference in his combination. It is likewise clear that it was on that feature that the examiner allowed the claims. In fact, in a letter accompanying the final submission of claims, Scoggin, through his attorney, stated that "agreement was reached between the Honorable Examiner and applicant's attorney relative to *limitations* which must be in the claims in order to define novelty over the previously applied disclosure of

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Lohse when considered in view of the newly cited patents of Mellon and Darley, Jr." (Italics added.) Moreover, those limitations were specifically spelled out as (1) the use of a rib seal and (2) an overcap whose lower edge did not contact the container cap. Mellon was distinguished, as was the Darley patent, *infra*, n. 18, on the basis that although it disclosed a hold-down cap with a seal located above the threads, it did not disclose a rib seal disposed in such position as to cause the lower peripheral edge of the overcap "to be maintained out of contacting relationship with [the container] cap * * * when * * * [the overcap] was screwed [on] tightly * * *." Scoggin maintained that the "obvious modification" of Lohse in view of Mellon would be merely to place the Lohse gasket above the threads with the lower edge of the overcap remaining in tight contact with the container cap or neck of the container itself. In other words, the Scoggin invention was limited to the use of a rib-rather than a washer or gasket-and the existence of a slight space between the overcap and the container cap.

[11] It is, of course, well-settled that an invention is construed not only in the light of the claims, but also with reference to the file wrapper or prosecution history in the Patent Office. *Hogg v. Emerson*, 11 How. 587 (1850); *Crawford v. Heysinger*, 123 U.S. 589 (1887). Claims as allowed must be read and interpreted with reference to rejected ones and to the state of the prior art; and claims that have been narrowed in order to obtain the issuance of a patent by distinguishing the prior art cannot be sustained to cover that which was previously by limitation eliminated from the patent. *Powers-Kennedy Co. v. Concrete Co.*, 282 U.S. 175, 185-186, 7 USPQ 122, 126 (1930); *Schriber Co. v. Cleveland Trust Co.*, 311 U.S. 211, 220-221, 47 USPQ 345, 348-349 (1940). Here, the patentee obtained his patent only by accepting the limitations imposed by the examiner. The claims were carefully drafted to reflect these limitations and Cook Chemical is not now free to assert a broader view of Scoggin's invention. The subject matter as a whole reduces, then, to the distinguishing features clearly incorporated into the claims. We now turn to those features. As to the space between the skirt of the overcap and the container cap, the District Court found:

"Certainly without a space so described there could be no inner seal with the cap, but such a space is not new or novel, it is necessary to the formation of the seal within the hold-down cap.

" *To me this language is descriptive of an element of the patent, but not a part of the invention* . It is too simple, really, to require much discussion. In this device the hold-down cap was intended to perform two functions-to hold down the sprayer head and to form a solid tight seal between the shoulder and the collar below. In assembling the element it is necessary to provide this space in order to form the seal." 220 F.Supp. at 420, 138 USPQ at 437. (Italics added.) The court correctly viewed the significance of the feature. We are at a loss to explain the examiner's allowance on the basis of such a distinction. Scoggin was able to convince the examiner that Mellon's cap contacted the bottle neck while his did not. Although the drawings included in the Mellon application show that the cap might touch the neck of the bottle when fully screwed down, there is nothing-absolutely nothing-which indicates that the cap was designed at any time to *engage* the bottle neck. It is palpably evident that Mellon embodies a seal formed by a gasket compressed between the cap and the bottle neck. It follows that the cap in Mellon will not seal if it does not bear down on the gasket and this would

be impractical, if not impossible, under the construction urged by Scoggin before the examiner. Moreover, the space so strongly asserted by Cook Chemical appears quite plainly on the Livingstone device, a reference not cited by the examiner. The substitution of a rib built into a collar likewise presents no patentable difference above the prior art. It was fully disclosed and dedicated to the public in the Livingstone patent. Cook Chemical argues, however, that Livingstone is not in the *pertinent* prior art because it relates to liquid containers having pouring spouts rather than pump sprayers. Apart from the fact that respondent made no such objection to similar references cited by the examiner,¹⁸ so restricted a view of the applicable prior art is not justified. The problems confronting Scoggin and the insecticide

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industry were not insecticide problems; they were mechanical closure problems. Closure devices in such a closely related art as pouring spouts for liquid containers are at the very least pertinent references. See, *II Walker*, Patents § 260 (Deller ed. 1937).

¹⁸ In addition to Livingstone and Mellon, the examiner cited Slade, U.S. Patent No. 2,844,290 (hold-down cap for detergent cans having a pouring spout); Nilson, U.S. Patent No. 2,118,222 (combined cap and spout for liquid dispensing containers); Darley, Jr., U.S. Patent No. 1,447,712 (containers for toothpaste, cold creams and other semi-liquid substances).

[12] Cook Chemical insists, however, that the development of a workable shipper-sprayer eluded Calmar, who had long and unsuccessfully sought to solve the problem. And, further, that the long-felt need in the industry for a device such as Scoggin's together with its wide commercial success supports its patentability. These legal inferences or subtests do focus attention on economic and motivational rather than technical issues and are, therefore, more susceptible to judicial treatment than are the highly technical facts often present in patent litigation. See *Learned Hand in Reiner v. I. Leon Co.*, 285 F.2d 501, 504, 128 USPQ 25, 27-28, *cert. den.* 366 U.S. 929, 129 USPQ 502 (1960). See also Comment, Subtests of "Nonobviousness," 112 Pa. L.Rev. 1169 (June 1964). Such inquiries may lend a helping hand to the judiciary which, as Mr. Justice Frankfurter observed, is most ill-fitted to discharge the technological duties cast upon it by patent legislation. *Marconi Wireless Co. v. United States*, 320 U.S. 1, 60, 57 USPQ 471, 496 (1943). They may also serve to "guard against slipping into hindsight," *Monroe Auto Equipment Co. v. Heckethorn Mfg. & Supply Co.*, 332 F.2d 406, 412, 141 USPQ 549, 555 (1964), *cert. denied* 379 U.S. 888, 143 USPQ 465, and to resist the temptation to read into the prior art the teachings of the invention in issue. However, these factors do not, in the circumstances of this case, tip the scales of patentability. The Scoggin invention, as limited by the Patent Office and accepted by Scoggin, rests upon exceedingly small and quite nontechnical mechanical differences in a device which was old in the art. At the latest, those differences were rendered apparent in 1953 by the appearance of the Livingstone patent, and unsuccessful attempts to reach a solution to the problems confronting Scoggin made before that time because wholly irrelevant. It is also irrelevant that no one apparently chose to avail themselves of knowledge stored in the Patent Office and readily available by the simple expedient of conducting a patent search—a prudent and nowadays common preliminary to well organized research. *Mast, Foos & Co. v. Stover Mfg. Co.*, 177 U.S. 485 (1900). To us, the limited claims of the Scoggin patent are clearly evident from the prior art as it stood at the time of the invention. We conclude that the claims in issue in the Scoggin patent must fall as not meeting the test of § 103, since the differences between them and the pertinent prior art would have been obvious to a person reasonably skilled in that art. The judgment of the Court of Appeals in No. 11 is *affirmed*. The judgment of the Court of Appeals in Nos. 37 and 43 is *reversed* and the cases *remanded* to the District Court for disposition not inconsistent with this opinion. *It is so ordered* Mr. Justice Stewart took no part in the consideration or decision of Nos. 37 and 43. Mr. Justice Fortas took no part in the consideration or decision of these cases.

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Source: USPQ, 1st Series (1929 - 1986) > U.S. Court of Appeals, Sixth Circuit > MONROE AUTO EQUIPMENT COMPANY v. HECKETHORN MANUFACTURING & SUPPLY COMPANY, 141 USPQ 549 (6th Cir. 1964)

141 USPQ 549

**MONROE AUTO EQUIPMENT COMPANY v. HECKETHORN MANUFACTURING &
SUPPLY COMPANY**

U.S. Court of Appeals Sixth Circuit

No. 15354

Decided May 14, 1964

332 F2d 406

Headnotes

PATENTS

[1] Patentability--Invention--In general (► 51.501)

Patentability--Utility (► 51.75)

Words and phrases(► 70.)

Court's real concern is not with patentability, a word which is dependent upon upon other factors and merely describes end result; patentability follows if three requisites of patentability, i.e., invention, novelty, and utility, are present; court's concern is with invention, its meaning, and whether it poses a question of law or fact.

[2] Patentability--Invention -- Definition (► 51.503)

Patentability -- Tests of -- In general (► 51.701)

It is virtually a practical impossibility to define adequately that abstraction which is called invention; still, court must have objective references and a place from which to start; for this, court turns to 35 U.S.C. 103, which, telescoped, shows that test is whether device would have been obvious to one skilled in the art; from this it may be said that invention is synonymous with unobviousness.

[3] Patentability--Invention--Law or fact question (► 51.507)

Atlantic & Pacific v. Supermarket, 340 U.S. 147, 87 USPQ 303, held that it is question of law whether proper standard of invention was applied, making it clear that court is concerned with a matter of statutory construction, i.e., interpreting statute to draw from it proper criteria for what constitutes invention; statutory construction is question of law; in practice, statutory construction is statutory application; this necessitates the existence of a factual basis to which law is applied; thus, invention, preliminarily, involves questions of fact; although invention is question of law, it is addressed to factual content which consists necessarily of questions of fact.

[4] Patentability--Invention--Law or fact question (► 51.507)

Three steps in ascertaining existence of invention are determination of what prior art was, determination of what improvement patentee made over prior art, and determination of whether improvement would have been obvious to one skilled in the art; first two steps involve questions of fact, but final step requires application of legal criteria and, therefore, is question of law fully reviewable by appellate court.

[5] Pleading and practice in courts--Jury trial--Validity and infringement (► 53.577)

New trial before jury as to validity of patent is not required where evidence was so clear and overwhelming that there were no factual issues to be resolved and patent was invalid as matter of law.

[6] Pleading and practice in courts--Jury trial--Validity and infringement (► 53.577)**Pleading and practice in courts--Motions--For summary judgment--In general (► 53.6331)**

If evidence is clear, court may direct verdict in patent cases or may enter summary judgment.

[7] Patentability--Invention--In general (► 51.501)

In considering question of obviousness, court must view prior art from point in time just prior to when patented device was made; court should guard against slipping into use of hindsight.

[8] Presumption from patent grant--In general (► 55.1)

Because of complexities of patent law and expertise of Patent Office, it is proper that presumption of validity attaches to patent.

[9] Presumption from patent grant--Weight of (► 55.9)

Presumption of patent validity is not conclusive.

[10] Presumption from patent grant--Patent Office consideration of prior art (► 55.5)

Presumption of patent validity is weakened if applicable prior art was not considered by Patent Office.

[11] Patentability--Anticipation--Patents--Foreign (► 51.2215)

Foreign patents can negative invention as effectively as United States patents.

[12] Patentability--New use or function--Nonanalogous art (► 51.557)

Although patent cannot be invalidated by prior patents from nonanalogous art, it does not necessarily follow that their disclosures may be ignored; disclosures can be used as illustrative of adaptation of well known scientific principles to practical uses.

[13] Patentability--Aggregation or combination--Of old elements (► 51.159)

Although old elements can be combined to create patentable device, such combination must possess invention.

[14] Patentability -- Evidence of -- Commercial success--Doubtful cases (► 51.4557)

Commercial success may be a relevant consideration in a close case, but no amount of commercial success can validate patent if device lacks invention.

[15] Patentability -- Evidence of -- Acquiescence in validity (► 51.453)

Consent decrees upholding validity of patent in actions against small companies are not controlling in action against another defendant.

[16] Patentability--Anticipation--In general (► 51.201)

Anticipation belongs with novelty; to be patentable, device must possess novelty as well as invention and utility; novelty does not exist if device was anticipated by prior device, whether patented or not; in order to have anticipation, all elements of device, or their equivalents, must be found in a single prior device where elements do substantially same work in substantially same way; in other words, device lacks novelty if there has been a substantially identical prior device.

[17] Patentability--Anticipation--In general (► 51.201)**Patentability--Invention--In general (► 51.501)**

Court must distinguish between novelty and invention in relation to anticipation; novelty and invention are separate tests, and anticipation belongs only with novelty; it is a mistake to use anticipation as equivalent

of invention; thus, it is incorrect to say that patent lacks invention because it is anticipated; if it is anticipated it lacks novelty; it lacks invention if it would have been obvious; hence, even though prior art may not anticipate patent, disclosures of prior art may negative invention, i.e., prior device may not be substantially identical to patented device and, therefore, cannot anticipate, but patented device may have been obvious in light of prior device.

[18] Patentability -- Anticipation -- Prior knowledge, use or sale (► 51.223)

Use and sale--Extent and character of use (► 69.5)

In order to anticipate, a prior device, though it does not have to be patented, must have been reduced to use and successfully performed; it must have been a public use, although it need not be a commercial use; sometimes the word experimental is used in contrast to public use; however, in certain situations, difference between public use and experimental use is not so clear as to admit of this being a wholly adequate standard; furthermore, courts have found sufficient reduction to use even though what was done would, by ordinary standards, be called experimental; suffice it to say that there must have been a reduction to use which was, to some extent, a public use.

[19] Use and sale--Extent and character of use (► 69.5)

Spring was reduced to public use where originator thereof made up six sets of springs which operated successfully when installed on automobiles operated by originator, his son, his employees, and a mechanic.

[20] Patentability -- Anticipation -- Prior knowledge, use or sale (► 51.223)

Since prior device was reduced to practice, it can negative novelty even though it was subsequently abandoned.

[21] Patentability--Anticipation -- Patent applications (► 51.219)

Abandoned patent application cannot be used in itself to anticipate but it can be used as evidence of the prior device.

[22] Patentability -- Anticipation -- Prior knowledge, use or sale (► 51.223)

Sale of single automobile on which anticipating device was mounted invalidates patent since sale was more than a year prior to patent's filing date.

[23] Amendments to patent application--New matter (► 13.5)

Use and sale--In general (► 69.1)

Doctrine of *Muncie v. Outboard*, 315 U.S. 759, 53 USPQ 1, is that claim which adds new matter to original application is invalid if filed more than one year after public use of device; however, claim is allowable if it is only a clarification or refinement of matter sufficiently disclosed in original application or drawing; question is whether there is anything in prior disclosures to support claim or whether claim broadens or changes original invention.

[24] Courts of appeals--Issues determined (► 29.10)

Because of invalidity, court does not reach question of infringement.

Particular Patents

Particular patents--Shock Absorber

2,896,938, Walker, Spring Adapters for Shock Absorbers, claims 2 and 3 invalid.

2,912,235, Walker, Automatic Auxiliary Support for a Vehicle, claim 14 invalid.

Case History and Disposition

Appeal from District Court for Western District of Tennessee, Boyd, J.; 133 USPQ 34 , 137 USPQ 148 .

Action by Monroe Auto Equipment Company against Heckethorn Manufacturing & Supply Company for patent infringement. From judgment for defendant, plaintiff appeals. Affirmed.

See also 135 USPQ 1 .

Attorneys

DON K. HARNESS (HARNESS, DICKEY & PIERCE and ROBERT L. BOYNTON on the brief) all of Detroit, Mich., for appellant.

ROBERT F. CONRAD (WATSON, COLE, GRINDLE & WATSON on the brief) both of Washington, D. C., for appellee.

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Judge

Before MILLER, CECIL, and PHILLIPS, Circuit Judges.

Opinion Text

Opinion By:

PHILLIPS, Circuit Judge.

This is an appeal from a judgment of the District Court holding invalid certain claims of two patents belonging to plaintiff-appellant.

The Monroe Auto Equipment Company, plaintiff-appellant, hereinafter referred to as plaintiff, brought suit against Heckethorn Manufacturing and Supply Company, defendant-appellee, hereinafter referred to as defendant, charging infringement of Patents No. 2,896,938 and No. 2,912,235, hereinafter referred to, respectively, as patents 938 and 235.

These two patents have had long and arduous journeys through the Patent Office. The original application which resulted in patent 938 was filed May 6, 1954, and the patent issued on July 28, 1959. Patent 235 was based on an application filed September 30, 1954, and was issued on November 10, 1959. Both of these applications were filed by Brooks Walker. Plaintiff is the owner of the patents as assignee of Walker.

The patents relate to auxiliary suspension devices designed for installation on the rear of an automobile. They are mounted at an inclined angle between the rear axle and the chassis frame, a so-called "sea-leg" mounting. They provide additional load carrying capacity and improve the lateral stability of the car.

The device includes a hydraulic direct acting tubular shock absorber surrounded by a relatively long spring of small diameter, the ends of which are supported on the relatively movable telescopic parts of the shock absorber. A rubber tubular spacer sleeve is positioned around the shock absorber so as to fit between it and the coil spring. This maintains the spring in a substantially aligned or concentric relationship relative to the shock absorber, and prevents the spring from buckling or thrashing around. In addition, the spacer sleeve prevents the spring from banging against and damaging the shock absorber, and prevents the noise which would result from the metal-to-metal contact between the spring and the shock absorber.

Plaintiff, the world's largest seller of replacement shock absorbers, began marketing this device in May, 1957, under the name of "Load-Leveler's." The product apparently has enjoyed considerable acceptance and commercial success.

In 1959 defendant began selling a device it called the "Level Ride," the alleged infringer. This too is a combination shock absorber and helper spring. It consists of a telescopic shock absorber disposed within a coil spring. Around the shock absorber and between it and the spring is a tubular rubber sleeve. Since it first went on sale, defendant has changed its device so that it now has two shorter rubber sleeves instead of the one longer sleeve.

At the trial plaintiff limited its charge of infringement to claims 2 and 3 of patent 938 and claim 14 of patent 235. The former refer to the rubber spacer sleeve which fits between the spring and the shock absorber. Claim 14 of patent 235 refers to the so-called "sea-leg" mounting, that is, at an inclined angle between axle and chassis.

In its original complaint plaintiff sought an injunction, an accounting, and legal relief in the form of damages.

Plaintiff also filed a demand for a jury trial. Defendant filed a motion to strike the demand for a jury trial, and this motion was granted by the District Judge, the Honorable Marion S. Boyd. The case was tried to the Court and resulted in a judgment holding both patents invalid. The findings and conclusions of the District Court are reported in 204 F.Supp. 249, 133 USPQ 34 .

Plaintiff appealed from this judgment and from the order striking the demand for a jury trial. This Court, at 305 F.2d 375, 135 USPQ 1 , vacated the judgment and *remanded* the case for consideration in the light of *Dairy Queen, Inc. v. Wood*, 369 U.S. 469, 133 USPQ 294 . In that case the Supreme Court held that a plaintiff is entitled to a jury trial, even in an essentially equitable suit, if any legal relief is sought involving factual questions that need to be resolved.

On remand, the District Court held that the patents were invalid as a matter of law, and that therefore there was no prejudice to the plaintiff in striking the demand for a jury trial. 214 F.Supp. 704, 137 USPQ 148 .

Plaintiff appeals from this judgment. It also filed in this Court a motion seeking an order that the case be *remanded* with directions for trial before a jury. This Court denied the motion, saying: "Our previous ruling was not that appellants were entitled to a jury trial * * * but only that the District Court consider the case again in light of the Supreme Court decision." This Court observed that "if the controlling facts of the case were undisputed so that the District Judge had only a legal question to decide, then appellant was not prejudiced by the refusal of the Judge to submit the issues to a jury." Finally, we there said: "Whether the opinion of the District Court, *on remand*, was correct remains to be determined in this appeal." That time has now come.

[1] First, however, because of the decision below and the posture of this

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case, we consider the issue of whether patentability involves a question of law or a question of fact. Of course our real concern is not with patentability, a word which is dependent upon other factors and merely describes an end result. Patentability follows, as the night follows the day, if the three requisites of patentability are present; these are invention, novelty, and utility. *Harvey v. Levine*, 322 F.2d 481, 483, 138 USPQ 659, 661 (C.A. 6); *Maytag Co. v. Murray Corp. of America*, 318 F.2d 79, 81, 137 USPQ 819, 821 (C.A. 6); *Allied Wheel Products v. Rude*, 206 F.2d 752, 760, 97 USPQ 510, 517 (C.A. 6). To paraphrase these requisites more in terms of the statute, to receive a patent there must be an invention which is new and useful. 35 U.S.C. § 101. Thus our real concern is with invention, its meaning, and whether it poses a question of law or fact.

[2] It is virtually a practical impossibility to define adequately that abstraction which we call invention. Long ago the Supreme Court said: "The truth is the word cannot be defined in such a manner as to afford any substantial aid in determining whether a particular device involves an exercise of the inventive faculty or not. In a given case we may be able to say that there is present invention of a very high order. In another we can see that there is lacking that impalpable something which distinguishes invention from simple mechanical skill." *McClain v. Ortmyer*, 141 U.S. 419, 427. This Court consistently has echoed this view. *Harvey v. Levine*, supra, at 485, 138 USPQ at 662; *Coats Loaders & Stackers, Inc. v. Henderson*, 233 F.2d 915, 921, 109 USPQ 332, 337 (C.A. 6); *Westinghouse Elec. & Mfg. Co. v. Powerlite Switchboard Co.*, 142 F.2d 965, 966, 62 USPQ 34, 35 (C.A. 6).

Judge Learned Hand concluded that in the final analysis the test of invention called for a subjective determination. *Kirsch Mfg. Co. v. Gould Mersereau Co.*, 6 F.2d 793, 794 (C.A. 2). Judge Frank said that "a decision as to whether or not a thing is an invention is a 'value' judgment." *Picard v. United Aircraft Corp.*, 128 F.2d 632, 639, 53 USPQ 563, 569 (C.A. 2) (concurring opinion). And another court said "it is a matter of feeling rather than of logic." *Warren Telechron Co. v. Waltham Watch Co.*, 91 F.2d 472, 473, 34 USPQ 135, 137 (C.A. 1).

In spite of the difficulty in defining invention, still we must have objective references and a place from which to start. For this we turn to the statute, which provides that a patent may not be obtained "if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains." 35 U.S.C. § 103. Telescoped, the test is whether the device would have been obvious to one skilled in the art. *Maytag Co. v. Murray Corp. of America*, supra, at 81, 137 USPQ at 821; *Firestone v. Aluminum Co. of America*, 285 F.2d 928, 930, 127 USPQ 407, 409 (C.A. 6); *Aluminum Co. of America v. Sperry Products, Inc.*, 285 F.2d 911, 917, 127 USPQ 394, 399 (C.A. 6), *cert. denied*, 368 U.S. 890, 131 USPQ 498 .

From this it may be said that invention is synonymous with unobviousness. Thus to say that a device lacks invention and that it is obvious is to state the same legal proposition in two ways. *Application of Jacoby*, 309 F.2d 513, 516, n. 3, 135 USPQ 317, 318-319 (CCPA). While the use of obviousness does not begin to solve

the problem of application, at least it gives us a touchstone for the contextual meaning of invention.

[3] We now turn to consider whether invention, or unobviousness, poses a question of law or of fact. At the risk of understatement, this is a question fraught with complexities, and one which has caused some courts recently to engage in extensive analysis. E.g., *Armour & Co. v. Wilson & Co.*, 274 F.2d 143, 124 USPQ 115 (C.A. 7) (separate opinion of Chief Judge Hastings); *Bergman v. Aluminum Lock Shingle Corp. of America*, 251 F.2d 801, 116 USPQ 32 (C.A. 9) (concurring opinion of Judge Pope).

In *Great Atlantic & Pacific Tea Co. v. Supermarket Equipment Corp.*, 340 U.S. 147, 87 USPQ 303, the Supreme Court held that it is a question of law whether the proper standard of invention has been applied. This case makes it clear that what we are concerned with here is a matter of statutory construction; that is, interpreting the statute to draw from it the proper criteria for what constitutes invention. Statutory construction, of course, is a question of law. *Armour & Co. v. Wilson & Co.*, *supra*, at 156, 124 USPQ at 125.

In practice, statutory construction is statutory application. This necessitates the existence of a factual basis to which the law is applied. Thus invention, preliminarily, involves questions of fact.

Therefore, to answer the question posed at the outset, invention is a question of law. However, the legal standard is addressed to a factual content which consists necessarily of questions of fact. This is the view which most courts, *espe*

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cially in recent years, have taken. *Tatko Bros. Slate Co. v. Hannon*, 270 F.2d 571, 122 USPQ 585 (C.A. 2), *cert. denied*, 361 U.S. 915, 123 USPQ 591; *Houston Oil Field Material Co. v. Claypool*, 269 F.2d 134, 122 USPQ 443 (C.A. 5); *Armour & Co. v. Wilson & Co.*, *supra*; *Bergman v. Aluminum Lock Shingle Corp. of America*, *supra*; *Blish, Mize and Silliman Hardware Co. v. Time Saver Tools, Inc.*, 236 F.2d 913, 111 USPQ 6 (C.A. 10); *Application of Sporck*, 301 F.2d 686, 133 USPQ 360 (CCPA).

As applied to a patent case, this view was best expressed as follows:

"The conflict between the statement that the question of invention is one of fact and the almost innumerable instances in which the courts have dealt with it as though it were one of law can only be explained by breaking the question of patentable invention down into its component parts: what the prior art was and what the patentee did to improve upon it, and then, whether what the patentee did is properly to be classified as an invention. The nature of the prior art and the nature of what the patentee did to improve upon it must always be questions of fact. The question of the name to be given to what was done by the patentee, whether it is to be called an invention over the prior art or whether it is not, is a question fundamentally of the meaning of the words used in the statute, and as such would seem to be a question of law." 1 Walker, *Patents* § 25, at 115 (Deller ed. Supp. 1963, at 34).

[4] Thus what we have in a patent case are three steps: First, a determination of what the prior art was; this involves factual questions. Secondly, there is a determination of what, if any, improvement the patentee has made over the prior art; this will usually turn on expert testimony and therefore is a question of fact. The final step is to determine whether the improvement would have been obvious to one skilled in the art. This requires application of a legal criteria and therefore is a question of law, fully reviewable by the appellate court.

This Court on occasion has said that invention is a question of fact. *Maytag Co. v. Murray Corp. of America*, 318 F.2d 79, 81, 137 USPQ 819, 821 (C.A. 6); *Sterling Aluminum Products, Inc. v. Bohn Aluminum & Brass Corp.*, 298 F.2d 538, 540, 132 USPQ 365, 367 (C.A. 6); *Cold Metal Products Co. v. E. W. Bliss Co.*, 285 F.2d 244, 248, 128 USPQ 59, 62 (C.A. 6), *cert. denied*, 366 U.S. 911, 129 USPQ 502. To the extent that the first two steps in the determination of invention involve questions of fact, we think these prior cases are not inconsistent with what we presently hold to be the correct rule. Furthermore, this Court, prior to the above-cited cases, recognized and accepted the proper approach to the problem when it held that "the question of invention is a question of law," but questions of fact may exist which affect the conclusion of law. *National Latex Products Co. v. Sun Rubber Co.*, 274 F.2d 224, 238, 123 USPQ 279, 289 (C.A. 6), *cert. denied*, 362 U.S. 989, 125 USPQ 668.

This, we hold, states the proper view. The essential point is that regardless of how important factual issues are in a particular case, the appellate court should be free to give effect to the general legislative standard. The scope of appellate review would be restricted if invention is treated as a question of fact.

Having decided that, although the ultimate question of invention is a question of law, there are some questions of fact to be decided, how does this affect the present case and plaintiff's right to a jury trial?

[5] Plaintiff first contends that since its complaint presented legal issues involving factual questions, it was entitled to a jury trial in light of the Supreme Court decision in *Dairy Queen, Inc. v. Wood*, 369 U.S. 469, 133 USPQ 294. Defendant concedes that the District Court would have erred in its refusal of a jury trial if the *Dairy Queen* decision had come down prior thereto. On the remand, the District Court considered the *Dairy Queen* case and concluded that the plaintiff had not been prejudiced "as a result of the striking of its demand for jury trial." 214 F.Supp. 704, 707, 137 USPQ 148, 150. The District Court held that the evidence had been so clear and overwhelming that there were no factual issues to be resolved and the patents were invalid as a matter of law. In effect, the Court said it would have been required to direct a verdict.

We are of the opinion that if the District Court was correct in these initial holdings then the subsequent decision in *Dairy Queen* would not require a new trial before a jury.

Aside from the *Dairy Queen* case, plaintiff makes the argument that if there were factual issues to be resolved then it is entitled to have the case *reversed* and *remanded* for a jury trial regardless of the weight of the evidence. In support of this proposition, plaintiff cites a few cases from the Fourth Circuit, particularly *Peterson v. Sucro*, 93 F.2d 878, 101 F.2d 282 (C.A. 4). Even assuming that represents the law in the Fourth Circuit, we are of the opinion

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that the better reasoned view is to the contrary.

[6] The prevailing, and we think the more logical view, is that denial of a jury trial is not reversible error if the court could have directed a verdict, and there was no evidence to go to the jury. *Klein v. Burns Mfg. Co.*, 245 F.2d 269, 113 USPQ 422 (C.A. 2); *Leimer v. Woods*, 196 F.2d 828 (C.A. 8); *Tanimura v. United States*, 195 F.2d 329 (C.A. 9). This would seem to follow logically from the rule, also applicable in patent cases, that if the evidence is clear the judge may direct a verdict or enter a summary judgment. *Klein v. Burns Mfg. Co.*, supra; *Berkeley Pump Co. v. Jacuzzi Bros.*, 214 F.2d 785, 102 USPQ 100 (C.A. 9); *Packwood v. Briggs & Stratton Corp.*, 195 F.2d 971, 93 USPQ 274 (C.A. 3), *cert. denied*, 344 U.S. 844, 95 USPQ 418; *Walker v. General Motors Corp.*, 225 F.Supp. 350, 139 USPQ 434 (N.D. Cal.).

Thus the question posed on this appeal is whether "the evidence is such that without weighing the credibility of the witnesses there can be but one reasonable conclusion as to the verdict." *Brady v. Southern Ry. Co.*, 320 U.S. 476, 479; and further, that such conclusion is the one reached by the District Court.

[7] We now come to the patented device which after all is the subject matter of this case. At the outset we take note of two well-established principles. The first is that in considering the question of obviousness, we must view the prior art from the point in time just prior to when the patented device was made. Many things may seem obvious after they have been made, and for this reason courts should guard against slipping into use of hindsight. We must be careful to "view the prior art without reading into that art the teachings of appellant's invention." *Application of Sporck*, 301 F.2d 686, 689, 133 USPQ 360, 362-363 (CCPA).

[8] [9] [10] Secondly, we also recognize that a presumption of validity attaches to a patent once it has been issued by the Patent Office. 35 U.S.C. § 282; *Aluminum Co. of America v. Sperry Products, Inc.*, 285 F.2d 911, 916, 127 USPQ 394, 399 (C.A. 6), *cert. denied*, 368 U.S. 890, 131 USPQ 498. This is only proper because of the complexities of patent law and the expertise of the Patent Office. See *Williams Mfg. Co. v. United Shoe Mach. Corp.*, 121 F.2d 273, 277, 50 USPQ 264, 269 (C.A. 6), *affirmed* 316 U.S. 364, 53 USPQ 478. However, the large number of patents declared invalid by the courts bear telling witness to the fact that this presumption is in no way conclusive. The presumption of course is weakened if applicable prior art has not been considered by the Patent Office. *Harvey v. Levine*, 322 F.2d 481, 484, 138 USPQ 659, 661 (C.A. 6); *Aluminum Co. of America v. Sperry Products, Inc.*, supra.

Claims 2 and 3 of patent 938, which are in issue, relate to the rubber spacer sleeve which fits between the shock absorber and the coil spring. In the statutory language, it must be determined if this would have been obvious to one skilled in the art.

[11] Prior art French Patent 1,044,393, Italian Patent 467,071, and British Patent 435,361, all relating to automobile suspension devices, each demonstrate a coil spring surrounding a tubular shock absorber. Parenthetically, there is no question but that foreign patents can serve just as effectively to negative invention. *Allied Wheel Products v. Rude*, 206 F.2d 752, 759, 97 USPQ 510, 516 (C.A. 6). These prior patents make it clear that the disposition of a shock absorber within a spring for a vehicular suspension device is old.

The claims in issue, however, relate to the rubber spacer sleeve. This is used primarily to prevent the spring from banging against the shock absorber, thereby causing both noise and damage to the shock and spring. *Farmer Patent 2,344,858* discloses a rubber sleeve between a coil spring and a tubular metallic element. This

was not cited as a reference by the Patent Office.

[12] The Farmer patent concerned a brake cylinder, and it is certainly true, as plaintiff contends, that a patent cannot be invalidated by prior patents from a non-analogous art. *Allied Wheel Products v. Rude*, supra; *Cincinnati Rubber Mfg. Co. v. Stowe-Woodward, Inc.*, 111 F.2d 239, 45 USPQ 383 (C.A. 6). However, assuming, without deciding, that the Farmer Patent is from a non-related art, it does not necessarily follow that its disclosures may be ignored. *Allied Wheel Products v. Rude*, supra, at 756, 97 USPQ at 513-514; *In re O'Connor*, 161 F.2d 221, 222, 73 USPQ 433, 435 (CCPA).

There was testimony that it would have been obvious to insert a rubber sleeve to prevent the metal-to-metal contact and resultant noise of the spring banging against the shock absorber. In other words, the use of rubber to prevent metal-to-metal contact is a well known principle. The Farmer Patent, assuming it is from a non-related art, could still be used as "illustrative of the adaptation of well known scientific principles to practical uses." *Application of Mariani*, 177 F.2d 293, 295, 83 USPQ 308, 309 (CCPA). Or, as this Court has said: "While it is true that patents have frequently been sustained where mechanical expedients were derived from non-

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analogous arts and so not obvious, this has not been true where what was borrowed was a commonly and generally known expedient in mechanical arts." *Detachable Bit Co. v. Timken Roller Bearing Co.*, 133 F.2d 632, 637, 56 USPQ 490, 495 (C.A. 6). See *Detroit Stoker Co. v. Brownell Co.*, 89 F.2d 422, 424, 33 USPQ 448, 450 (C.A. 6).

We are of the opinion that the use of a rubber sleeve to prevent metal-to-metal contact was an obvious mechanical expediency, and cannot rise to the level of invention. *Enterprise Mfg. Co. v. Shakespeare Co.*, 106 F.2d 800, 803, 43 USPQ 45, 48-49 (C.A. 6), *cert. denied*, 309 U.S. 665, 44 USPQ 719 .

[13] Plaintiff contends that invention is not limited to the rubber spacer sleeve, but that it lies in plaintiff's unique combination of admittedly old elements. It is of course true that old elements can be combined to create a patentable device. *Sparton Corp. v. Evans Products Co.*, 293 F.2d 699, 704, 130 USPQ 387, 391 (C.A. 6), *cert. denied*, 368 U.S. 967, 132 USPQ 703 ; *Cold Metal Process Co. v. Republic Steel Corp.*, 233 F.2d 828, 838-39, 109 USPQ 185, 192-193 (C.A. 6); see *Reiner v. I. Leon Co.*, 285 F.2d 501, 503, 128 USPQ 25, 27 (C.A. 2). Obviously, however, the combination of old elements must possess invention, which, for the reasons herein set forth, we do not find in the instant case.

We conclude that, in view of the prior art, what plaintiff did would have been obvious to one skilled in the art. Therefore, Claims 2 and 3 of Patent 938 are invalid for lack of invention. See *United Parts Mfg. Co. v. Lee Motor Products, Inc.*, 266 F.2d 20, 121 USPQ 206 (C.A. 6).

[14] Before continuing, it may be well to pass upon two other points raised by the plaintiff. First, plaintiff emphasizes the great commercial success of its device, saying that this is evidence of a new and useful invention. Defendant responds by pointing to plaintiff's extensive utilization of advertising. In any event, it seems clear that in a close case commercial success may be a relevant consideration. *Aluminum Co. of America v. Sperry Products, Inc.*, 285 F.2d 911, 923, 127 USPQ 394, 404 (C.A. 6), *cert. denied*, 368 U.S. 890, 131 USPQ 498 ; *National Latex Products Co. v. Sun Rubber Co.*, 274 F.2d 224, 239, 123 USPQ 279, 290 (C.A. 6), *cert. denied* 362 U.S. 989, 125 USPQ 668 . However, this Court has said many times that if a device lacks invention then no amount of commercial success can validate the patent. *Harvey v. Levine*, 322 F.2d 481, 486, 138 USPQ 659, 663 (C.A. 6); *Aluminum Co. of America v. Sperry Products, Inc.*, supra; *Cold Metal Products Co. v. E. W. Bliss Co.*, 285 F.2d 244, 248, 128 USPQ 59, 62-63 (C.A. 6), *cert. denied*, 366 U.S. 911, 129 USPQ 502 .

[15] Plaintiff also points to the fact that its patents have been declared valid by a number of courts. In support of this, plaintiff puts forward a number of consent decrees which resulted from infringement suits brought by plaintiff against various small companies. We are of the view that these consent decrees are in no sense controlling. In a similar situation, this Court said "the consent decrees are not convincing. * * * the purchase of peace * * * is often a wise course for the small manufacturer." *Kay Jewelry Co. v. Gruen National Watch Case Co.*, 40 F.2d 600, 604, 5 USPQ 112, 116 (C.A. 6). See also, *Picard v. United Aircraft Corp.*, 128 F.2d 632, 641-42, 53 USPQ 563, 571-572 (C.A. 2) (Frank, J., concurring), *cert. denied*, 317 U.S. 651, 55 USPQ 493 .

It is to be noted that when these patents did go to trial they were declared invalid. *Monroe Auto Equipment Co. v. Superior Industries, Inc.*, 220 F.Supp. 941, 138 USPQ 385 (S.D. Cal.).

The District Court, in the instant case, also held that Claims 2 and 3 of patent 938 were anticipated by a prior

device and therefore lacked novelty and were invalid under 35 U.S.C. § 102(a).

[16] To digress momentarily to discuss some ground rules, anticipation belongs with novelty. To be patentable, a device must possess novelty as well as invention and utility. Novelty does not exist if the patented device has been anticipated by a prior device, whether patented or not. In order to have anticipation, it is necessary that all of the elements of the patented device, or their equivalents, be found in a single prior device where the elements do substantially the same work in substantially the same way. *Firestone v. Aluminum Co. of America*, 285 F.2d 928, 930, 127 USPQ 407, 409 (C.A. 6); *Allied Wheel Products v. Rude*, 206 F.2d 752, 760, 97 USPQ 510, 517 (C.A. 6); 1 Walker, *Patents* § 47, at 255. (Deller ed.). In other words, a device lacks novelty if there is, or has been, a substantially identical prior device.

[17] We must be careful to make the distinction between novelty and invention in relation to anticipation. Novelty and invention are two separate tests, and anticipation belongs only with novelty. This Court has pointed out that some courts tend, mistakenly, to use anticipation as an equivalent of invention. *Allied Wheel Products v. Rude*, *supra*, at 761, 97 USPQ at 517-518; *Firestone v. Aluminum Co. of America*, *supra*. See also, *Borkland v. Pedersen*, 244 F.2d 501, 502, 113 USPQ 401, 402 (C.A. 7). Thus it is incorrect to say that a patent lacks in

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vention because it is anticipated. If it is anticipated it lacks novelty; it lacks invention if it would have been obvious.

From this it should be clear that even though the prior art may not anticipate the patent in question, the disclosures of the prior art may negative invention. *Harvey v. Levine*, 322 F.2d 481, 483, 138 USPQ 659, 661 (C.A. 6); *Allied Wheel Products v. Rude*, *supra*, at 760, 97 USPQ at 517; *Leishman v. General Motors Corp.*, 191 F.2d 522, 530, 91 USPQ 190, 197 (C.A. 9); *Seymour v. Ford Motor Co.*, 44 F.2d 306, 309, 7 USPQ 182, 184-185 (C.A. 6). That is, a prior device may not be substantially identical to the patented device and therefore cannot anticipate; however, it may be that in the light of this prior device the patented device would have been obvious.

[18] In order to anticipate, a prior device, though it does not have to be patented, must have been reduced to use and successfully performed. *National Latex Products Co. v. Sun Rubber Co.*, 274 F.2d 224, 233, 123 USPQ 279, 285 (C.A. 6), *cert. denied*, 362 U.S. 989, 125 USPQ 668; *Stearns v. Tinkor & Rasor*, 220 F.2d 49, 56, 104 USPQ 234, 239 (C.A. 9), *cert. denied*, 350 U.S. 830, 107 USPQ 362; *Simmons v. Hansen*, 117 F.2d 49, 51, 48 USPQ 345, 348 (C.A. 8); *Oliver Machinery Co. v. Gellman*, 104 F.2d 11, 13, 41 USPQ 249, 250-251 (C.A. 6); *Gaiser v. Linder*, 253 F.2d 433, 117 USPQ 209 (CCPA). It must have been a public use, although it need not be a commercial use. *Corona Cord Tire Co. v. Dovan Chemical Corp.*, 276 U.S. 358, 384. Sometimes the word experimental is used in contrast to public use. However, in certain situations, the difference between a public use and an experimental use is not so clear as to admit of this being a wholly adequate standard. Furthermore, courts have found sufficient reduction to use even though what was done would, by ordinary standards, be called experimental. E.g., *Picard v. United Aircraft Corp.*, 128 F.2d 632, 53 USPQ 563 (C.A. 2), *cert. denied*, 317 U.S. 651, 55 USPQ 493. Suffice it to say that there must have been a reduction to use which was, to some extent at least, a public use.

With these principles in mind, we turn to consider whether claims 2 and 3 of patent 938 lacked novelty because anticipated by a prior device. We reemphasize the fact these claims relate to the non-metallic spacer sleeve between the shock absorber and the coil spring. We note that the patent date of 938 is May 6, 1954.

From the record the following facts are clearly established: in 1953, Fred Knoedler, President of Knoedler Manufacturers and holder of Patent 2,432,544 relating to a tractor seat support, put a coil spring around a standard shock absorber and installed such a device on his own car. This proved unsatisfactory because of the noise caused by the spring banging against the shock absorber. To remedy this, Knoedler put first a rubber and then a plastic sleeve around the shock absorber to prevent the spring from banging against it. Thus satisfied, Knoedler had sales literature prepared for the purpose of marketing his device under the name of a Hydro Shock Booster Spring. This literature was subsequently distributed, to a limited extent at least, by Knoedler and his son.

On September 1, 1953, Knoedler, through his attorneys, filed a patent application on this device. This application indicates a non-metallic sleeve around the shock absorber. This application was allowed, but a patent was never issued because of the failure to pay the final fee.

[19] Finally, it is established that Knoedler made up six sets of these springs which were installed on his two cars, and on cars belonging to his son, two employees, and a mechanic. The springs operated successfully, and we hold that this constituted a sufficient reduction to public use.

These facts clearly demonstrate that the Knoedler device was prior to patent 938, that it consisted of substantially the same elements operating in the same manner, and that it was sufficiently reduced to a public use. We hold that these facts establish anticipation and therefore claims 2 and 3 of patent 938 are invalid for lack of novelty. See *Corona Cord Tire Co. v. Dovan Chemical Corp.*, 276 U.S. 358; *Brush v. Condit*, 132 U.S. 39; *Coffin v. Ogden*, 85 U.S. 120.

[20] Plaintiff makes much of the fact that Knoedler abandoned his device. The answer to this contention is that if the prior device has been reduced to practice then it can negative novelty even though it is subsequently abandoned. *Corona Cord Tire Co. v. Dovan Chemical Corp.*, 276 U.S. 358; *Rosaire v. Baroid Sales Div., National Lead Co.*, 218 F.2d 72, 104 USPQ 100 (C.A. 5), *cert. denied*, 349 U. S. 916, 105 USPQ 518 ; *Picard v. United Aircraft Corp.*, 128 F.2d 632, 53 USPQ 563 (C.A. 2), *cert. denied*, 317 U.S. 651, 55 USPQ 493 . As the Supreme Court said in the first-cited case: "It is doubtless true that Kratz by his course in respect to his discovery as to the use of D.P.G. has abandoned any claim as against the public for a patent, but that is a very different thing from saying that it was abandoned as against a subsequent discoverer or patentee." 276 U.S. at 384-85.

[21] Similarly, plaintiff argues that Knoedler's abandoned patent application cannot be used to anticipate plaintiff's

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patent. It is true that an abandoned patent application cannot be used in itself to anticipate; however, it can, as here, be used as evidence of the prior device. *U. S. Blind Stitch Mach. Corp. v. Reliable Mach. Works*, 67 F.2d 327, 328, 19 USPQ 269, 270-271 (C.A. 2); *Curtiss-Wright Corp. v. Link Aviation, Inc.*, 182 F.Supp. 106, 118, 124 USPQ 266, 276 (N.D.N.Y.); *Application of Schlittler*, 234 F.2d 882, 885, 110 USPQ 304, 306-307 (CCPA).

We come now to plaintiff's patent 235, of which claim 14 is the only claim in suit. Claim 14 relates to the combination shock absorber and overload spring assemblies being installed in an angular or "sea-leg" fashion in the rear suspension of an automobile. The District Court held this claim invalid for lack of invention.

The so-called sea-leg mounting is old and well known in the art. In the *S.A.E. Journal* for May, 1949, it was noted: "most cars have adopted what is known as the sea-leg mounting for the rear shock absorbers." See *Monroe Auto Equipment Co. v. Superior Industries, Inc.*, 220 F.Supp. 941, 944 (S.D. Cal.).

Italian Patent 466,870 discloses a shock absorber and spring arrangement mounted in a sea-leg fashion. French Patent 1,044,393 and Italian Patent 467,071 disclose a shock absorber disposed within a coil spring and mounted in sea-leg fashion. U. S. Patent 2,159,203 discloses a standard shock absorber in a sea-leg mounting.

Plaintiff contends that in these prior art patents the suspension devices perform in a different manner or serve a different purpose than in patent 235 and therefore they cannot be used to anticipate. This might be true if we were concerned here with novelty. However, as we hereinabove have pointed out, the fact that none of these prior art references are so like patent 235 that they could negative novelty does not mean that they may not negative invention.

As before, plaintiff contends that it is the unique combination of this particular suspension system with this particular mounting which constitutes invention. As we said, a combination of old elements may create a patentable device, provided the quality of invention is present. We find no such quality here. Plaintiff's use of the sea-leg mounting was a mere expediency and not an exercise of the inventive faculty.

We conclude, then, that plaintiff's improvement over the prior art would have been obvious to one skilled in the art, and therefore claim 14 of patent 235 is invalid for lack of invention.

Furthermore, we hold that claim 14 of patent 235 is invalid for lack of novelty as it was anticipated by the Knoedler device discussed above. In addition to testimony, there was documentary evidence that Knoedler's suspension device was mounted in a sea-leg fashion. Plaintiff attempts to overcome this by saying that it was not reduced to practice. As we have already pointed out, it is clear that Knoedler made six sets of his device which were put on different cars and operated successfully.

[22] In addition, one of the six sets was given to one John Truesdon, an employee of Knoedler, who installed the set in a sea-leg mounting. In August, 1953, Truesdon sold his car with the Knoedler device still mounted in the same way. Since this sale was more than a year prior to the filing date of patent 235, claim 14 of said patent is invalid under 35 U.S.C. § 102(b).

We hold that these clearly established facts constitute anticipation and therefore claim 14 of patent 235 is

invalid for lack of novelty.

[23] The District Court also held, and defendant has *argued* in this Court, that the pertinent claims of both patents were also invalid under *Muncie Gear Works, Inc. v. Outboard Marine & Mfg. Corp.*, 315 U.S. 759, 53 USPQ 1 . The so-called Muncie Gear doctrine is that a claim which adds new matter to the original application is invalid if filed more than one year after public use of the device. If the later claim is only a clarification or refinement of matter which has been sufficiently disclosed in the original application or drawing then it is allowable. As a practical matter, new claims are constantly being added to an application, sometimes more than one year after the device has gone into public use. Thus the question is whether there is anything in the prior disclosures which will support the subsequent claim, or does the claim broaden or change the original invention. This Court has discussed and applied the Muncie Gear doctrine in *National Latex Products Co. v. Sun Rubber Co.*, 274 F.2d 224, 123 USPQ 279 (C.A. 6), *cert. denied*, 362 U.S. 989, 125 USPQ 668 ; *Coats Loaders & Stackers, Inc. v. Henderson*, 233 F.2d 915, 109 USPQ 332 (C.A. 6); *Cold Metal Process Co. v. Republic Steel Corp.*, 233 F.2d 828, 109 USPQ 185 (C.A. 6), *cert. denied*, 352 U.S. 891, 111 USPQ 467 .

Since, however, we have held the relevant claims of these two patents invalid for lack of invention and lack of novelty, we do not deem it necessary to discuss the issue of late claiming which might be posed by this case.

[24] Similarly, because of the invalidity, we do not reach the question of infringement. *Cold Metal Products Co. v. E. W. Bliss Co.*, 285 F.2d 244, 250, 128 USPQ 59, 64 (C.A. 6), *cert. denied*, 366

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U.S. 911, 129 USPQ 502 ; *Bergman v. Aluminum Lock Shingle Corp. of America*, 251 F.2d 801, 804, 116 USPQ 32, 34 (C.A. 9).

Throughout our disposition of this case we have not been unmindful of plaintiff's right to a jury trial. We are of the opinion, however, that the facts were clearly established and that there were no factual issues to be resolved by a jury. Therefore plaintiff was not prejudiced by the denial of a jury trial.

For the reasons hereinabove discussed, the judgment of the District Court is *affirmed*.

- End of Case -

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s): Joel D. OXMAN et al.)	Group Art Unit:	3732
)		
Serial No.: 10/643,748	)	Examiner:	John J. Wilson
Confirmation No.: 4133)		
)		
Filed: 19 August 2003)		
)		
For: DENTAL ARTICLE FORMS AND METHODS)		

AMENDMENT AND RESPONSE

Mail Stop Amendment

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

In response to the Office Action mailed 23 February 2006, please amend the above-identified application as follows:

Amendments to the Specification begin on the page entitled "Amendments to the Specification."

Amendments to the Claims are reflected in the listing of claims which begins on the page entitled "Amendments to the Claims."

Amendments to the Drawings begin on the page entitled "Amendments to the Drawings." and include: an attached new sheet.

Remarks begin on the page entitled "Remarks."

Amendment and Response

Serial No.: 10/643,748

Confirmation No.: 4133

Filed: 19 August 2003

For: DENTAL ARTICLE FORMS AND METHODS

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Amendments to the Specification

Please insert the following new paragraph at page 5, line 28 (immediately before the heading of DETAILED DESCRIPTION OF ILLUSTRATIVE EMBODIMENTS OF THE INVENTION):

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is an example of a dental article form 10 according to the present invention.

Amendments to the Claims

This listing of claims replaces all prior versions, and listings, of claims in the above-identified application:

1. (Currently Amended) A dental article form comprising an organic composition in the form of a self-supporting structure having a first shape and sufficient malleability to be formed into a second shape, wherein the organic composition comprises a surfactant system mixed therein, and wherein the dental article form comprises a reservoir that is capable of being filled with one or more hardenable dental materials and removed after at least partially hardening the dental material to form a dental article.
2. (Original) The dental article form of claim 1 wherein the organic composition is curable.
3. (Original) The dental article form of claim 2 wherein the curable organic composition comprises an initiator system and a resin system comprising at least one ethylenically unsaturated component.
4. (Original) The dental article form of claim 1 wherein the organic composition is noncurable.
5. (Original) The dental article form of claim 4 wherein the noncurable organic composition comprises a noncurable polymer selected from the group consisting of a polycaprolactone, a polyvinylacetate, an ethylene-vinyl acetate copolymer, a polyethylene glycol, a wax, and mixtures thereof.
6. (Original) The dental article form of claim 1 wherein the organic composition comprises a filler system.

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For: DENTAL ARTICLE FORMS AND METHODS

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7. (Original) The dental article form of claim 6 wherein the filler system comprises fibers, particulate filler, or mixtures thereof.
8. (Original) The dental article form of claim 6 wherein the filler system comprises an inorganic material comprising nanoscopic particles.
9. (Original) The dental article form of claim 8 wherein the inorganic material comprises surface hydroxyl groups.
10. (Canceled)
11. (Original) The dental article form of claim 1 which is a form for a dental article selected from the group consisting of a crown, an inlay, an onlay, a bridge, an orthodontic appliance, a maxillofacial prosthesis, and a tooth splint.
12. (Currently Amended) The dental article form of claim 1 wherein the reservoir containing contains the one or more hardenable dental materials.
13. (Original) The dental article form of claim 1 which is in packaging.
14. (Original) The dental article form of claim 13 wherein the packaging is light-blocking packaging.
15. (Original) The dental article form of claim 1 comprising one or more of the following features: a handle attached to the dental article form at a location removed from the base of the dental article form; a vented handle through which excess amounts of hardenable dental material

can pass during placement of the dental article form; and one or more lines of weakness that may be separated to remove the dental article form from dental material after placement of the dental article form.

16. (Currently Amended) A dental article form comprising a noncurable organic composition in the form of a self-supporting structure having a first shape and sufficient malleability to be formed into a second shape, wherein the organic composition comprises a surfactant system mixed therein, and wherein the dental article form comprises a reservoir that is suitable for being filled with one or more hardenable dental materials.
17. (Original) The dental article form of claim 16 wherein the noncurable organic composition comprises a noncurable polymer selected from the group consisting of a polycaprolactone, a polyvinylacetate, an ethylene-vinyl acetate copolymer, a polyethylene glycol, a wax, and mixtures thereof.
18. (Original) The dental article form of claim 16 wherein the noncurable organic composition comprises a filler system.
19. (Original) The dental article form of claim 18 wherein the filler system comprises fibers, particulate filler, or mixtures thereof.
20. (Original) The dental article form of claim 18 wherein the filler system comprises an inorganic material comprising nanoscopic particles.
21. (Original) The dental article form of claim 20 wherein the inorganic material comprises surface hydroxyl groups.

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22. (Original) The dental article form of claim 16 which is a form for a dental article selected from the group consisting of a crown, an inlay, an onlay, a bridge, an orthodontic appliance, a maxillofacial prosthesis, and a tooth splint.
23. (Original) The dental article form of claim 16 comprising a reservoir containing one or more hardenable dental materials.
24. (Original) The dental article form of claim 16 which is nonremovable.
25. (Original) The dental article form of claim 16 which is in packaging.
26. (Original) The dental article form of claim 16 which is removable after at least partially hardening the dental material to form a dental article.
27. (Original) The dental article form of claim 16 comprising one or more of the following features: a handle attached to the dental article form at a location removed from the base of the dental article form; a vented handle through which excess amounts of hardenable dental material can pass during placement of the dental article form; and one or more lines of weakness that may be separated to remove the dental article form from dental material after placement of the dental article form.
28. (Currently Amended) A dental article form comprising an organic composition free of added filler in the form of a self-supporting structure having a first shape and sufficient malleability to be formed into a second shape, wherein the organic composition comprises a surfactant system mixed therein, and wherein the dental article form comprises a reservoir that is suitable for being filled with one or more hardenable dental materials.

29. (Original) The dental article form of claim 28 wherein the organic composition free of added filler is curable.
30. (Original) The dental article form of claim 29 wherein the curable organic composition comprises an initiator system and a resin system comprising at least one ethylenically unsaturated component.
31. (Original) The dental article form of claim 28 wherein the organic composition free of added filler is noncurable.
32. (Original) The dental article form of claim 30 wherein the noncurable organic composition comprises a noncurable polymer selected from the group consisting of a polycaprolactone, a polyvinylacetate, an ethylene-vinyl acetate copolymer, a polyethylene glycol, a wax, and mixtures thereof.
33. (Original) The dental article form of claim 28 which is nonremovable.
34. (Currently Amended) The dental article form of claim 28 ~~comprising a~~ wherein the reservoir ~~containing~~ contains one or more hardenable dental materials.
35. (Original) The dental article form of claim 28 which is a form for a dental article selected from the group consisting of a crown, an inlay, an onlay, a bridge, an orthodontic appliance, a maxillofacial prosthesis, and a tooth splint.
36. (Original) The dental article form of claim 28 which is in packaging.

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37. (Original) The dental article form of claim 28 which is removable after hardening the dental material to form a dental article.
38. (Original) The dental article form of claim 28 comprising one or more of the following features: a handle attached to the dental article form at a location removed from the base of the dental article form; a vented handle through which excess amounts of hardenable dental material can pass during placement of the dental article form; and one or more lines of weakness that may be separated to remove the dental article form from dental material after placement of the dental article form.
39. (Currently Amended) A method of preparing a dental article, the method comprising:
selecting a dental article form having a reservoir and comprising an organic composition in the form of a self-supporting structure having a first shape and sufficient malleability to be formed into a second shape, wherein the organic composition comprises a surfactant system mixed therein;
filling the reservoir with one or more hardenable dental materials;
placing the dental article form filled with one or more hardenable dental materials on a subject's tooth structure;
at least partially hardening the hardenable material to form the dental article;
optionally customizing the dental article outside of the subject's mouth;
cementing the dental article to the subject's tooth structure; and
~~optionally~~ removing the dental article form from the article;
wherein the dental article form is reshaped while in the subject's mouth before or after filling the reservoir with the hardenable dental material.
40. (Canceled)

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41. (Canceled)

42. (Currently Amended) The method of claim ~~[[41]]~~ 39 wherein the organic composition is curable.

43. (Original) The method of claim 42 wherein the curable organic composition comprises an initiator system and a resin system comprising at least one ethylenically unsaturated component.

44. (Currently Amended) The method of claim ~~[[41]]~~ 39 wherein the organic composition is noncurable.

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Amendments to the Drawings

The attached sheet includes Figure 1. This sheet is a new sheet to comply with 37 C.F.R. §1.81(c). No new matter has been added.

Attachment: New Sheet

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Remarks

The Office Action mailed 23 February 2006 has been received and reviewed. Claims 1, 12, 16, 28, 34, 39, 42, and 44 having been amended, claims 10, 40, and 41 having been canceled, without prejudice, the pending claims are claims 1-9, 11-39, and 42-44. Support for the amendments can be found in Applicants' specification, for example, at page 4, lines 18-21, and page 12, lines 13-21. Reconsideration and withdrawal of the rejections are respectfully requested.

Drawings

The Examiner indicated that the subject matter of this application admits of illustration by a drawing to facilitate understanding of the invention. Although it is clear such drawing is not required to facilitate understanding of the invention, a drawing is being submitted herewith to expedite prosecution. An amendment to the specification is also included herewith. Applicants respectfully request entry of the figure and amendment to the specification.

Obviousness-Type Double Patenting Rejection

Claims 1-44 were provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-78 of copending Application No. 10/219,398 in view of Neustadter et al. (U.S. Patent No. 3,656,387). Upon an indication of otherwise allowable subject matter and in the event this rejection is maintained, Applicants will provide an appropriate response.

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The 35 U.S.C. §102 Rejection

The Examiner rejected claims 1, 2, 4, 5, 11, 16, 17, 22, 24, and 26 under 35 U.S.C. §102(b) as being anticipated by Neustadter et al. (U.S. Patent No. 3,565,387). This rejection is respectfully traversed. As admitted by the Examiner at page 4 of the Office Action, Neustadter et al. do not “show the use of a surfactant,” and do not “show a reservoir of material.”

The Examiner rejected claims 39 and 40 under 35 U.S.C. §102(b) as being anticipated by Simor (U.S. Patent No. 3,585,723). This rejection is respectfully traversed. Simor does not teach a dental article form comprising an organic composition having a surfactant system mixed therein.

The 35 U.S.C. §103 Rejection

The Examiner rejected claims 3, 28-33, 35, and 37 under 35 U.S.C. §103(a) as being unpatentable over Neustadter et al. (U.S. Patent No. 3,565,387). This rejection is respectfully traversed.

The Examiner rejected claims 6-9 and 18-21 under 35 U.S.C. §103(a) as being unpatentable over Neustadter et al. (U.S. Patent No. 3,565,387) in view of Wilson (U.S. Patent No. 5,487,663). This rejection is respectfully traversed.

The Examiner rejected claim 10 under 35 U.S.C. §103(a) as being unpatentable over Neustadter et al. (U.S. Patent No. 3,565,387) in view of Adair (U.S. Patent No. 4,431,420). This rejection is respectfully traversed.

The Examiner rejected claims 12, 23, and 34 under 35 U.S.C. §103(a) as being unpatentable over Neustadter et al. (U.S. Patent No. 3,565,387) in view of Pierson (U.S. Patent No. 5,951,294). This rejection is respectfully traversed.

The Examiner rejected claims 13, 14, 25, and 36 under 35 U.S.C. §103(a) as being unpatentable over Neustadter et al. (U.S. Patent No. 3,565,387) in view of Uthoff (U.S. Patent No. 5,102,332). This rejection is respectfully traversed.

The Examiner rejected claims 15, 27, and 38 under 35 U.S.C. §103(a) as being unpatentable over Neustadter et al. (U.S. Patent No. 3,565,387) in view of Kahn (U.S. Patent No. 3,949,476). This rejection is respectfully traversed.

The Examiner rejected claim 40 under 35 U.S.C. §103(a) as being unpatentable over Simor (U.S. Patent No. 3,585,723) in view of Kennedy (U.S. Patent No. 4,129,946). This rejection is respectfully traversed.

The Examiner rejected claims 41-44 under 35 U.S.C. §103(a) as being unpatentable over Simor (U.S. Patent No. 3,585,723) in view of Neustadter et al. (U.S. Patent No. 3,565,387). This rejection is respectfully traversed.

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The Examiner rejected claims 1-44 under 35 U.S.C. §103(a) as being unpatentable over Karim et al. (U.S. Patent Publication No. 2003/0114553) in view of Neustadter et al. (U.S. Patent No. 3,565,387). This rejection is respectfully traversed.

None of the cited documents teaches a dental article form comprising an organic composition in the form of a self-supporting structure having a first shape and sufficient malleability to be formed into a second shape, wherein the organic composition comprises a surfactant system mixed therein, and wherein the dental article form comprises a reservoir that is capable of being filled with one or more hardenable dental materials and removed after at least partially hardening the dental material to form a dental article.

Adair is cited by the Examiner for the use of a surfactant, but in Adair the surfactant is painted on the form (see, e.g., column 8, lines 6-9), not mixed in the organic composition that forms the dental article form.

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For: DENTAL ARTICLE FORMS AND METHODS

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Summary

It is respectfully submitted that the pending claims 1-9, 11-39, and 42-44 are in condition for allowance and notification to that effect is respectfully requested. The Examiner is invited to contact Applicants' Representatives, at the below-listed telephone number, if it is believed that prosecution of this application may be assisted thereby.

Respectfully submitted

By

Mueiting, Raasch & Gebhardt, P.A.

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Minneapolis, MN 55458-1415

Phone: (612) 305-1220

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May 11, 2006
Date

By:

Ann M. Mueiting

Reg. No. 33,977

Direct Dial (612) 305-1217

CERTIFICATE UNDER 37 CFR §1.10:

"Express Mail" mailing label number: EV 201 876 681 US

Date of Deposit: 11 May 2006

I hereby certify that the Transmittal Letter and the paper(s) and/or fee(s), as described hereinabove, are being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 CFR §1.10 on the date indicated above and is addressed to: **Mail Stop Amendment**, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

By:

Name:

Rachel Baglioni-Gebhardt
Rachel Baglioni-Gebhardt

(LARGE ENTITY TRANSMITTAL UNDER RULE 1.10)

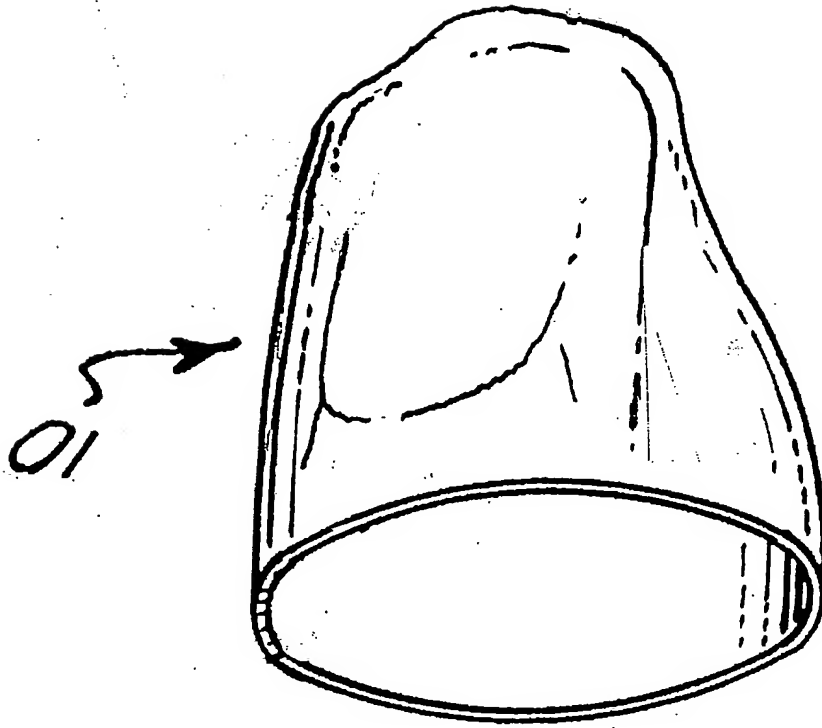


Fig. 1

Receipt is hereby acknowledged for the following in the U.S. Patent and Trademark Office:

Applicant(s): Joel D. OXMAN et al.

Serial No.: 10/643,748

Confirmation No.: 4133

Filed: 19 August 2003

Title: DENTAL ARTICLE FORMS AND METHODS

Enclosed: Amendment and Response (15 pgs); New Sheet (1 figure on 1 sheet);
and transmittal document (in triplicate).

Mailed: May 11, 2006 via Express Mail (No. EV 201 876 681 US)

Docket: 58614US002

AMM/rgg

EV201876681US

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s): Joel D. OXMAN et al.

Group Art Unit: 3732

Serial No.: 10/643,748

Examiner: John J. Wilson

Confirmation No.: 4133

Filed: 19 August 2003

Docket No.: 58614US002

Title: DENTAL ARTICLE FORMS AND METHODS

Mail Stop Amendment

Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

We are transmitting the following documents along with this Transmittal Sheet (which is submitted in triplicate):

- ☒ An itemized return postcard.
- ☐ A Petition for Extension of Time for __ month(s) and a check in the amount of \$__ for the required fee.
- ☐ An Information Disclosure Statement (__ pgs); copies of __ applications; 1449 forms (__ pgs); and copies of __ documents cited on the 1449 forms.
- ☐ A request for continued examination (RCE) and a check in the amount of \$__, for the required filing fee.
- ☐ An Appeal Brief and a check in the amount of \$__, for the required Appeal Brief filing fee.
- ☐ A check in the amount of \$__, for __.
- ☐ A certified copy of a __ application, Serial No. __, filed ____, the right of priority of which is claimed under 35 U.S.C. §119.
- ☒ Other: New Sheet (1 figure on 1 sheet).
- ☒ Amendment and Response (15 pgs). No Additional fee is required. The fee has been calculated as shown:

Fee Calculation for Claims Pending After Amendment					
	Pending Claims after Amendment (1)	Claims Paid for Earlier (2)	Number of Additional Claims (1-2)	Cost per Additional Claim	Additional Fees Required
Total Claims				x \$50 =	
Independent Claims				x \$200 =	
One or More New Multiple Dependent Claims Presented? If Yes, Add \$360 Here →					
Total Additional Claim Fees Required					

Please consider this a PETITION FOR EXTENSION OF TIME for a sufficient number of months to enter these papers and please charge any additional fees or credit overpayment to Deposit Account No. 13-4895. Triplicate copies of this sheet are enclosed.

MUETING, RAASCH & GEBHARDT, P.A.

Customer Number: 26813

By: 

Name: Ann M. Mueeting

Reg. No.: 33,977

Direct Dial: 612-305-1217

Facsimile: 612-305-1228

CERTIFICATE UNDER 37 CFR §1.10:

"Express Mail" mailing label number: EV 201 876 681 US

Date of Deposit: 11 May 2006

I hereby certify that the Transmittal Letter and the paper(s) and/or fee(s), as described hereinabove, are being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 CFR §1.10 on the date indicated above and is addressed to: **Mail Stop Amendment**, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

By: 

Name: Rachel Gagliardi-Gesau

(LARGE ENTITY TRANSMITTAL UNDER RULE 1.10)



OFFICIAL
Expedited Examining Procedure
Group 3732

PATENT
Docket No. 58614US002

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s):	Joel D. OXMAN et al.	)	Group Art Unit:	3732
)		
Serial No.:	10/643,748	)	Examiner:	John J. Wilson
Confirmation No.:	4133)		
)		
Filed:	19 August 2003)		
)		
For:	<u>DENTAL ARTICLE FORMS AND METHODS</u>			

AMENDMENT AND RESPONSE UNDER 37 CFR §1.116

Mail Stop AF
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

In response to the Office Action mailed 27 June 2006, please amend the above-identified application as follows:

Amendments to the Specification begin on the page entitled "Amendments to the Specification."

Amendments to the Claims are reflected in the listing of claims which begins on the page entitled "Amendments to the Claims."

Amendments to the Drawings begin on the page entitled "Amendments to the Drawings." and include attached replacement sheet.

Remarks begin on the page entitled "Remarks."

An Attachment including amended drawing figures is attached following the last page of this Communication.

Amendments to the Specification

Please replace the paragraph beginning at page 5, line 28, with the following amended paragraph.

BRIEF DESCRIPTION OF THE DRAWINGS

[[Fig.]] FIG. 1 is an example of a dental article form 10 according to the present invention.

FIG. 2 is a view of the labial surface of one dental crown form according to the present invention including a handle.

FIG. 3 is a cross-sectional view of the dental crown form of FIG. 2 taken along line 3-3 in FIG. 2.

FIG. 4 is a cross-sectional view of the dental crown form of FIG. 3 after placement on a prepared tooth.

FIG. 5 is a view of an interproximal surface of another dental crown form according to the present invention illustrating a line of weakness formed therein.

Please insert the following new paragraphs (in the order presented below) at page 16, line 3 (immediately before the heading "EXAMPLE"):

FIG. 1 is an example of one dental article form according to the present invention.

FIG. 2 is a view of another dental crown form, FIG. 3 is a cross-sectional view of the same dental crown form, and FIG. 4 is a cross-sectional view of the same dental crown form fitted over a prepared tooth. The dental crown form 110 includes a body 112 defining a tooth-shaped volume in its interior that is generally in the shape of the tooth to be restored. Because healthy teeth are found in a variety of anatomical shapes, the body 112 and its tooth-shaped volume may take a variety of anatomical shapes that correspond to those of healthy teeth. As such, those of skill in the art will recognize that the precise shape of the dental crown form 110

and its tooth-shaped volume will vary depending on the anatomical shape of the tooth to be repaired.

The body 112 includes a base 114 defining an opening through which a tooth to be restored is inserted. In anatomical terms, the base 114 can be correlated to the cervical/gingival region of an actual tooth. The dental crown form 110 also includes an incisal/occlusal region 116 located opposite the base 114.

The body 112 of the dental crown form 110 can be manufactured of any suitable material or materials that are structurally capable of maintaining the desired shape of a tooth. Examples of some suitable materials for the dental crown forms of the present invention include, but are not limited to polyacrylonitriles, polyesters, polyamides, polyureas, polyolefins, polystyrenes, etc.

The dental crown form 110 also includes a handle 120 extending from the body 112. It may be preferred that the handle 120 be attached to the body 112 at a location removed from the base 114. By "removed from the base" it is meant that the handle is attached to the body at a location that is not at the base 114, but is, rather, spaced from the base 114 by at least some distance. In the depicted embodiment, the handle 120 extends from the labial surface of the dental crown form 110 (slightly below the incisal/occlusal region 116). Alternatively, the handle 120 may extend directly from the incisal/occlusal region 116 or from the lingual surface or one of the interproximal side surfaces of the dental crown form 110. It may, however, be preferred that the handle 120 be attached to the body 112 on a labial or lingual surface as opposed to an interproximal side surface to facilitate manipulation and placement of the dental crown form 110 between neighboring teeth.

By providing a handle 120 that is attached to the dental crown form 110 at a location removed from the base 114, manipulation of the dental crown form 110 within the mouth of a patient during placement of the dental crown form 110 may be enhanced. It may be preferred that the handle 120 be attached to the dental crown form 110 at a location that is closer to the incisal/occlusal region 116 than the base 114. Referring to FIG. 3 in particular, the dental crown form 110 may be characterized as having an overall height h measured from the base 114 to the

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For: DENTAL ARTICLE FORMS AND METHODS

furthest point in the incisal/occlusal region 116. It may be preferred that the handle 120 be attached to the body 112 of the dental crown form 110 within a handle region h' (see FIG. 3) that is defined as the outer surface of the dental crown form 110 within a distance $h/2$ from the furthest point in the incisal/occlusal region 116. It may be more preferred that the handle region h' be defined as the outer surface of the dental crown form 110 within a distance $h/3$ from the furthest point in the incisal/occlusal region 116.

The handle 120 includes a tip 122 located distal from the body 112. The handle 120 may preferably be hollow, i.e., have a handle volume that is in fluid communication with the tooth-shaped volume of the body 112 through a vent opening 121 formed in the body 112. If hollow, the handle 120 may have a hollow tubular shape with any suitable cross-section, e.g., circular, oval, triangular, rectangular, etc.

If the handle 120 is hollow (as seen in FIG. 3) and fluid communication between the tooth-shaped volume of the body 112 and the handle volume of the handle 120 is desired, then a vent opening will need to be formed in the body 112 to provide that desired fluid communication.

As an alternative to a hollow handle 120 in fluid communication with the tooth-shaped volume of the body 112, the body 112 may include one or more vents formed therein through which excess hardenable dental material 130 may pass when placing the filled dental crown form 110 on a prepared tooth 140 (as seen in FIG. 4). Such vents may be provided in the dental crown form 110 as packaged when provided to the practitioner or they may added by the practitioner after removing the dental crown form from the package (as described in, e.g., U.S. Patent 5,951,294 to Pierson).

If the handle 120 is hollow, the tip 122 may preferably be sealed as depicted in FIGS. 2 and 3. When sealed, the handle volume is preferably not in fluid communication with the ambient air surrounding the tip 122. The sealing may be performed by any suitable technique or techniques. In the depicted embodiment, the tip 122 is molded closed during manufacturing. Other examples of sealing techniques may include, e.g., heat sealing, providing a plug within the

handle, providing a cap over the exterior of the tip, etc. It may be preferred that some indicia be provided on the handle 120 or attached thereto to identify, e.g., the dental crown form itself and/or the dental restorative material located therein (if any).

FIG. 4 is a cross-sectional view of the dental crown form 110 of FIGS. 2 and 3 in place over a prepared tooth 140. The prepared tooth 140 may be prepared such that an appropriate bond is formed between the hardenable dental material 130 and the prepared tooth 140. Such preparation may include, e.g., shaping, etching, priming, coating with a dental adhesive, etc.

A portion of the mass of hardenable dental material 130 in the dental crown form 110 is displaced by the prepared tooth 140 as the dental crown form 110 is moved into position. The amount of hardenable dental material 130 displaced by the prepared tooth may preferably exit from within the body 112 of the dental crown form 110 into the volume of the handle 120 through vent opening 121. To facilitate movement of the hardenable dental material 130 into the handle 120, the handle 120 may preferably be vented to the ambient atmosphere.

If the tip 122 of the handle 120 is sealed as depicted in FIGS. 2 and 3, the venting may involve removal of the tip 122 by, e.g., cutting the tip 122 with a scissors, knife, or other instrument. If the tip 122 is sealed by other techniques, then actions appropriate for that sealing technique may be employed (e.g., removal of a plug or cap from the tip, etc.).

FIG. 4 is a side view of an interproximal side surface of another dental crown form 110 according to the present invention. The dental crown form 110 includes a body 112 that defines an interior tooth-shaped volume, along with a base 114 and an incisal/occlusal region 116 similar to those discussed above. The tooth-shaped volume of the body 112 may contain hardenable dental material as packaged and provided to the practitioner.

If the handle 120 is hollow, it may include a plug 128 of, e.g., material that is capable of restricting flow of the hardenable dental material 130 through the handle 120. A plug 128 may be provided in addition to a sealed tip 122 or in place of the sealed tip 122. Examples of some suitable materials for the plug 128 may be sorbent material designed to absorb dental materials as described in, e.g., U.S. Patent 5,707,236 (Swanson et al.).

FIG. 5 is a side view of an interproximal side surface of another dental crown form 210 according to the present invention. The dental crown form 210 includes a body 212 that defines an interior tooth-shaped volume, along with a base 214 and an incisal/occlusal region 216 similar to those discussed above. The tooth-shaped volume of the body 212 may contain hardenable dental material as packaged and provided to the practitioner.

The dental crown form 210 also includes at least one line of weakness 240 formed in the body 212. Although only one line of weakness 240 is depicted in FIG. 5, a second line of weakness may preferably be provided on the opposite interproximal side surface of the dental crown form 210.

The lines of weakness 240 preferably define lines along which the body 212 may preferably separate when tension is applied across the line of weakness 240. The lines of weakness 240 may take a variety of forms, e.g., thinned lines in which the wall thickness of the body is reduced relative to the surrounding wall thickness, score lines formed after the dental crown form 210 is manufactured, lines of perforations, etc. In yet another variation, the line of weakness may be defined by a filament molded in the body 212 such that the body preferentially separates along the filament. Other variations providing a means of separation may be envisioned by those skilled in the art.

Separation of the body 212 along the one or more lines of weakness 240 may be facilitated by a variety of optional features. For example, notches 242 may be provided at the ends of the lines of weakness 240. The notches 242 may act as stress concentrators to initiate separation along the lines of weakness 240.

The dental crown form 210 may also include tabs 250. The tabs 250 may be used to both facilitate manipulation of the dental crown form during placement on a prepared tooth and to provide a location at which the dental crown form may be gripped to apply the force required to separate the one or more lines of weakness in the body 212. As such, it may be preferred to provide two or more tabs 250 on opposite sides of the base 214 of the body 212 as depicted in FIG. 5. The tabs 250 may alternatively be located at a position removed from the base 214.

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Some indicia may be included on the tabs 250 or attached thereto to identify, e.g., the dental crown form itself and/or the hardenable dental material located therein (if any).

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Amendments to the Drawings

The attached sheet of drawings includes replacement Figure 1 (formalized) and new Figures 2-5.

Attachment: Replacement Sheet

Remarks

The Office Action mailed 27 June 2006 has been received and reviewed. Claims 1-9, 11-39, and 42-44 remain pending. Reconsideration and withdrawal of the rejections are respectfully requested.

The Drawings Objection and Specification Amendments

Applicants note that Figure 1 and its accompanying description submitted in the response filed on May 11, 2006 have been accepted, but that the objection remains in effect.

In response, Applicants are submitting additional Figures 2-5 along with descriptions of those figures (as presented in the "Amendments to the Specification"). Applicants have also include a replacement formalized version of Figure 1 along with the new Figures 2-5.

Applicants respectfully request entry of these amendments and withdrawal of the objection.

The added material (both figures and descriptions) is obtained from U.S. Patent Application Serial No. 10/643,771 (Attorney Docket No. 58449US002), titled DENTAL CROWN FORMS AND METHODS, which was incorporated by reference in the present application as filed at p. 15, lines 23-27 and p. 17, lines 1-3.

More specifically, the additional description being inserted into the present application can be found on p. 5, line 1 to p. 11, line 27 of U.S. Patent Application Serial No. 10/643,771 (with some portions deleted). Figures 2-5 as presented in this response correspond with Figures 1-4 of U.S. Patent Application Serial No. 10/643,771. It should be noted that the figure numbers and the reference numbers in the figures have been changed so as not to conflict with existing Figure 1 of the present application.

Because U.S. Patent Application Serial No. 10/643,771 was incorporated by reference into the present application, Applicants respectfully submit that no new matter is presented in these amendments. Entry of these amendments are, therefore, respectfully requested.

Obviousness-Type Double Patenting Rejection

Claims 1-9, 11-39, and 42-44 were provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-78 of copending Application No. 10/219,398 in view of Neustadter (U.S. Patent No. 3,565,387). Upon an indication of otherwise allowable subject matter and in the event this rejection is maintained, Applicants will provide an appropriate response.

The 35 U.S.C. §112, Second Paragraph, Rejection

The Examiner rejected claim 18 under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention. Specifically, the Examiner alleged that in line 1, “the noncurable” lacks proper antecedent basis within the claims. This is respectfully traversed. Claim 18 depends from claim 16. Claim 16 recites “a noncurable” composition, thereby providing antecedent basis for “the noncurable composition” of claim 18.

Applicants’ Invention

Each of Applicants’ claims recites a dental article form that includes an organic composition (including a surfactant system mixed therein) in the form of a self-supporting structure having a first shape and sufficient malleability to be formed into a second shape. This is describing the organic composition that is used to make the dental article form (as opposed to the hardenable dental material that is placed within the reservoir of the dental article form).

The term “self-supporting” means that the composition is dimensionally stable and will maintain its shape (e.g., preformed shape of a crown form) without significant deformation at room temperature (i.e., about 20°C to about 25°C) for at least about two weeks when free-standing (i.e., without the support of packaging or a container). Preferably, the compositions of the present invention are dimensionally stable at room temperature for at least about one month, and more preferably, for at least about six months. Preferably, the compositions of the present

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invention are dimensionally stable at temperatures above room temperature, more preferably up to about 40°C, even more preferably up to about 50°C, and even more preferably up to about 60°C. This definition applies in the absence of conditions that activate an initiator system (if present) and in the absence of an external force other than gravity.

The term “sufficient malleability” means that the self-supporting structure is capable of being custom shaped and fitted, for example, to a patient’s mouth, under a moderate force (i.e., a force that ranges from light finger pressure to that applied with manual operation of a small hand tool, such as a dental composite instrument). Herein, the phrase “malleable” refers to a material that is malleable under conditions in the mouth or that can be comfortably withstood by oral tissue (e.g., temperature and/or oral fluids, including water).

The 35 U.S.C. §103 Rejections

The Examiner rejected claims 1-9, 11, 12, 16-24, 26, 28-35, and 37 under 35 U.S.C. §103(a) as being unpatentable over Kennedy (U.S. Patent No. 4,129,946) in view of Neustadter et al. (U.S. Patent No. 3,565,387) and Ivanov et al. (U.S. Patent No. 4,113,499). The Examiner rejected claims 13, 14, 25, and 36 under 35 U.S.C. §103(a) as being unpatentable over Kennedy (U.S. Patent No. 4,129,946) in view of Neustadter et al. (U.S. Patent No. 3,565,387) and Ivanov et al. (U.S. Patent No. 4,113,499) as applied to claims 1, 16, and 28 above, and further in view of Uthoff (U.S. Patent No. 5,102,332). The Examiner rejected claims 15, 27, and 38 under 35 U.S.C. §103(a) as being unpatentable over Kennedy (U.S. Patent No. 4,129,946) in view of Neustadter et al. (U.S. Patent No. 3,565,387) and Ivanov et al. (U.S. Patent No. 4,113,499) as applied to claims 1, 16, and 28 above, and further in view of Kahn (U.S. Patent No. 3,949,476). These rejections are respectfully traversed.

The combination of the three documents, Kennedy in view of Neustadter et al. and Ivanov et al., does not teach or suggest Applicants’ claimed invention. That is, the combination of the three documents does not teach or suggest a dental article form having all of the recited characteristics. For example, the combination of the three documents does not provide a dental

article form that is both self-supporting and malleable and includes a reservoir that is capable of being filled with one or more hardenable dental materials. Thus, it is respectfully submitted that this combination of documents does not provide a prima facie case of obviousness.

Although Neustadter et al. may define a malleable material, Kennedy does not disclose a “self-supporting” dental article form, as defined by Applicants’ specification at page 5, lines 3-7 (“The term “self-supporting” means that the composition is dimensionally stable and will maintain its shape (e.g., preformed shape of a crown form) without significant deformation at room temperature (i.e., about 20°C to about 25°C) for at least about two weeks when free-standing (i.e., without the support of packaging or a container).”). Although the material of the dental crown form of Kennedy (co-polyester plastic) is described as not deforming and slumping as readily as previously used materials (see column 3, lines 36-39), Kennedy describes the need for a “stiffening flange 20” that “substantially strengthens the relatively thin structure of the tooth form, and prevents unwanted deformation of the form during storage and handling” (see column 3, lines 33-36). Thus, although the dental crown form of Kennedy is more “self-supporting” than previously used materials, Kennedy does not teach or suggest a dental article form that is dimensionally stable under the conditions described by Applicants without support of packaging or a container.

Applicants’ self-supporting and malleable dental article form is made of an organic composition that includes a surfactant system mixed therein. Thus, the Examiner cited Ivanov et al. for disclosing a surfactant mixed in a disposable mold form; however, it is respectfully submitted that one of skill in the art would not look to Ivanov et al. for information to assist in making a dental article form. Ivanov et al. is directed to molds used in the foundry industry. Not only is this a completely nonanalogous technology area, Ivanov et al. do not add that which is missing from the combination of Kennedy and Neustadter et al.

The combination of the three documents (Kennedy in view of Neustadter et al. and Ivanov et al.) does not provide a dental article form that is both self-supporting and malleable, made of an organic composition that includes a surfactant system mixed

therein, and includes a reservoir that is capable of being filled with one or more hardenable dental materials.

Furthermore, the other cited documents Uthoff and Kahn do not add that which is missing from the combination of Kennedy in view of Neustadter et al. and Ivanov et al. Thus, it is respectfully submitted that these 103 rejections be withdrawn.

The Examiner rejected claims 39 and 42-44 under 35 U.S.C. §103(a) as being unpatentable over Simor (U.S. Patent No. 3,585,723) in view of Neustadter (U.S. Patent No. 3,565,387), Ivanov et al. (U.S. Patent No. 4,113,499), and Wilson (U.S. Patent No. 5,487,663). This rejection is respectfully traversed.

The combination of the four documents, Simor in view of Neustadter et al. and Ivanov et al. and Wilson, does not teach or suggest Applicants' claimed method, as recited in claim 39. That is, the combination of the four documents does not teach or suggest a method of making a dental article having all the recited steps, including using a dental article form having all of the recited characteristics. Thus, it is respectfully submitted that this combination of documents does not provide a prima facie case of obviousness.

Although Neustadter et al. may define a malleable material, Simor does not teach a dental article form comprising an organic composition having a surfactant system mixed therein. Although Ivanov et al. disclose a surfactant mixed in a disposable mold form, Ivanov et al. is directed to molds used in the foundry industry, a completely nonanalogous technology area.

The Examiner acknowledged that this combination of three documents (Simor in view of Neustadter et al. and Ivanov et al.) does not teach or suggest each of the steps recited in Applicants' claimed method. Thus, the Examiner cited Wilson for a disclosure of removing the dental article form from the dental article; however, Wilson does not teach that the dental article form that is self-supporting and malleable. Thus, it is respectfully submitted that there is no motivation to combine the cited four documents.

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Even if there were such motivation to combine these four documents, one skilled in the art would have no reasonable expectation whatsoever that the disclosure of Simor combined with the disclosures of Neustadter et al. and Ivanov et al. and Wilson would necessarily provide the method recited in claim 39. Withdrawal of this rejection is respectfully requested.

It is submitted that these rejections (particularly the latter rejection of the method claims where four documents are needed to make the rejection) may only be made by impermissible hindsight reconstruction, that is, by picking and choosing from each document that which supports these rejections. One cannot "simply [to] engage in a hindsight reconstruction of the claimed invention, using the Applicant's structure as a template and selecting elements from references to fill the gaps." In re Gorman, 933 F.2d 982, 18 U.S.P.Q.2d 1885, 1888 (Fed. Cir. 1991). Applicants respectfully submit that these rejections could only have been made by means of impermissible hindsight reconstruction.

As recently reasserted in Princeton Biochemicals, Inc. v. Beckman Coulter, Inc. (Fed. Cir., No. 04-1493, June 9, 2005), 35 U.S.C. §103 specifically requires an assessment of the claimed invention "as a whole." This "as a whole" assessment of the invention requires a showing that an artisan of ordinary skill in the art at the time of invention, confronted by the same problems as the inventor and with no knowledge of the claimed invention, would have selected the various elements from the cited references and combined them in the claimed manner. In other words, 35 U.S.C. §103 requires some suggestion or motivation, before the invention itself, to make the new combination. See In re Rouffet, 149 F.3d 1350, 1355-56 (Fed. Cir. 1998).

This "as a whole" instruction in 35 U.S. §103 prevents evaluation of the invention part by part. Without this important requirement, an obviousness assessment might successfully break an invention into its component parts, then find a reference corresponding to each component. This line of reasoning would import hindsight into the obviousness determination by using the invention as a roadmap to find its prior art components. Further, this improper method would

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discount the value of combining various existing features or principles in a new way to achieve a new result - often the essence of invention. *Ruiz v. A.B. Chance Co.*, 357 F.3d 1270, 1275 (Fed. Cir. 2004). Simply identifying the various elements of a claim in the cited references does not render a claim obvious. *Ruiz*, 357 F.3d at 1275. Instead, 35 U.S. §103 requires some suggestion or motivation in the prior art to make the new combination. *Rouffet*, 149 F.3d at 1355-56. Applicants submit that the Examiner has engaged in an improper part by part analysis of the claimed invention. Withdrawal of each of these rejections is respectfully requested.

The Examiner rejected claims 1-9, 11-39, and 42-44 under 35 U.S.C. §103(a) as being unpatentable over *Karim et al.* (U.S. Patent Publication No. 2003/0114553) in view of *Neustadter et al.* (U.S. Patent No. 3,565,387). This rejection is respectfully traversed.

It is respectfully submitted that the present application and the invention of *Karim et al.*, as described in U.S. Patent Publication No. 2003/0114553, were, at the time the present invention was made, owned by 3M Intellectual Property Co.

Withdrawal of this rejection is respectfully requested.

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Summary

It is respectfully submitted that the pending claims 1-9, 11-39, and 42-44 are in condition for allowance and notification to that effect is respectfully requested. The Examiner is invited to contact Applicants' Representatives, at the below-listed telephone number, if it is believed that prosecution of this application may be assisted thereby.

Respectfully submitted

By

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Sept. 13, 2006
Date

By: Ann M. Mueiting
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CERTIFICATE UNDER 37 CFR §1.10:

"Express Mail" mailing label number: EV 201 891 750 US

Date of Deposit: 13 September 2006

I hereby certify that the Transmittal Letter and the paper(s) and/or fee(s), as described hereinabove, are being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 CFR §1.10 on the date indicated above and is addressed to: **Mail Stop Amendment**, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450

By: R. Gagliardi-Gesau
Name: Rachel Gagliardi-Gesau

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ATTACHMENT - REPLACEMENT SHEET

Serial No.: 10/643,748

Docket No.: 58614US002

Pursuant to 37 C.F.R. §1.121(d), attached are replacement Figure 1 and new Figures 2-5.

1/1

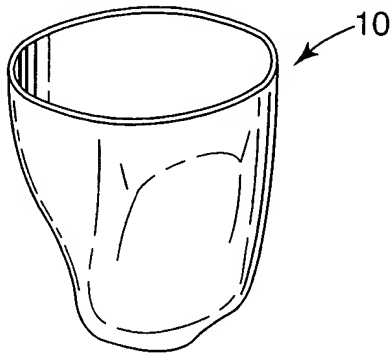


Fig. 1

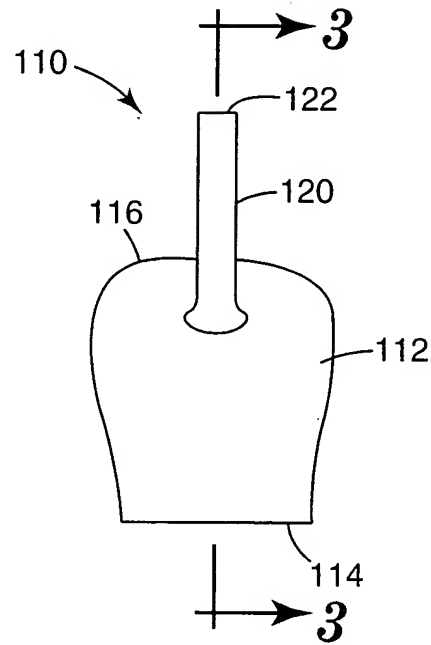


Fig. 2

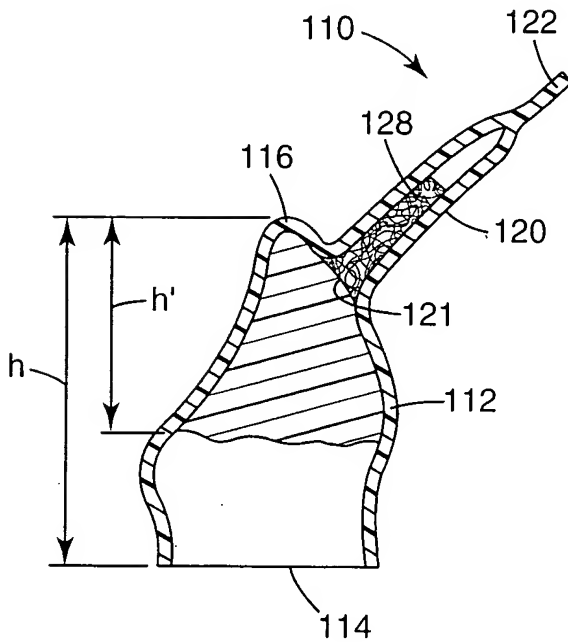


Fig. 3

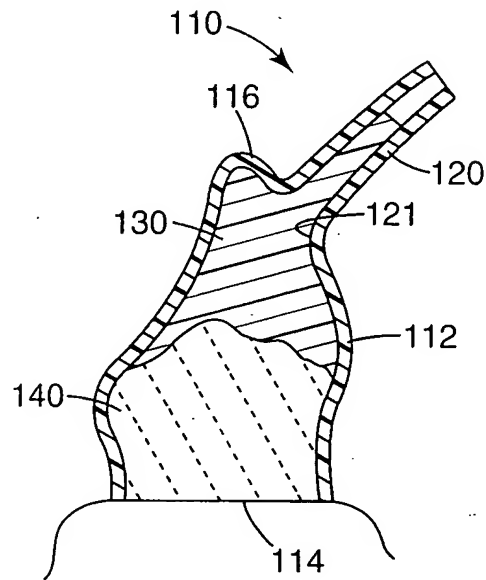


Fig. 4

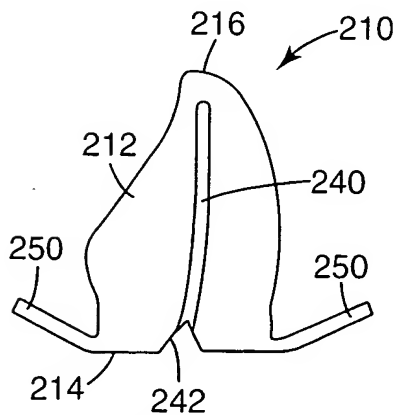


Fig. 5



Receipt is hereby acknowledged for the following in the U.S. Patent and Trademark Office:

Applicant(s): Joel D. OXMAN et al.

Serial No.: 10/643,748

Confirmation No.: 4133

Filed: 19 August 2003

Title: DENTAL ARTICLE FORMS AND METHODS

Enclosed: Amendment and Response Under 37 C.F.R. 1.116 (17 pgs);
Replacement Drawing (1 pg); and transmittal document (in triplicate).

Mailed: September 13, 2006 via Express Mail (No. EV 201 891 750 US)
Docket: 58614US002 (M&R 100.58614010) AMM/rgg

EV201891750US



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s): Joel D. OXMAN et al.

Group Art Unit: 3732

Serial No.: 10/643,748

Examiner: John J. Wilson

Confirmation No.: 4133

Filed: 19 August 2003

Docket No.: 58614US002

Title: DENTAL ARTICLE FORMS AND METHODS

Mail Stop Amendment

Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

We are transmitting the following documents along with this Transmittal Sheet (which is submitted in triplicate):

- ☒ An itemized return postcard.
- ☐ A Petition for Extension of Time for __ month(s) and a check in the amount of \$__ for the required fee.
- ☐ An Information Disclosure Statement (__ pgs); copies of __ applications; 1449 forms (__ pgs); and copies of __ documents cited on the 1449 forms.
- ☐ A request for continued examination (RCE) and a check in the amount of \$__, for the required filing fee.
- ☐ An Appeal Brief and a check in the amount of \$__, for the required Appeal Brief filing fee.
- ☐ A check in the amount of \$__, for __.
- ☐ A certified copy of a __ application, Serial No. __, filed ____, the right of priority of which is claimed under 35 U.S.C. §119.
- ☒ Other: Replacement Drawing (1 pg).
- ☒ Amendment and Response Under 37 C.F.R. 1.116 (17 pgs).
- ☒ No Additional fee is required. The fee has been calculated as shown:

Fee Calculation for Claims Pending After Amendment					
	Pending Claims after Amendment (1)	Claims Paid for Earlier (2)	Number of Additional Claims (1-2)	Cost per Additional Claim	Additional Fees Required
Total Claims				x \$50 =	
Independent Claims				x \$200 =	
One or More New Multiple Dependent Claims Presented? If Yes, Add \$360 Here →					
Total Additional Claim Fees Required					

Please consider this a PETITION FOR EXTENSION OF TIME for a sufficient number of months to enter these papers and please charge any additional fees or credit overpayment to Deposit Account No. 13-4895. Triplicate copies of this sheet are enclosed.

CERTIFICATE UNDER 37 CFR §1.10:

"Express Mail" mailing label number: EV 201 891 750 US

Date of Deposit: 13 September 2006

I hereby certify that the Transmittal Letter and the paper(s) and/or fee(s), as described hereinabove, are being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 CFR §1.10 on the date indicated above and is addressed to: Mail Stop Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

Signature: *R. Gayherda (Biden)*

Name: Rachel Baglioni - Graham

MUETING, RAASCH & GEBHARDT, P.A.

Customer Number: 26813

By: *Ann M. Mueeting*
Ann M. Mueeting

Reg. No.: 33,977

Direct Dial: 612-305-1217

Facsimile: 612-305-1228



PATENT
Docket No. 58614US002

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s): Joel D. OXMAN et al.	)	Group Art Unit:	3732
)		
Serial No.: 10/643,748	)	Examiner:	John J. Wilson
Confirmation No.: 4133)		
)		
Filed: 19 August 2003)		
)		
For: DENTAL ARTICLE FORMS AND METHODS)		

AMENDMENT AND RESPONSE

Mail Stop RCE

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

In response to the Advisory Action mailed 16 October 2006, please amend the above-identified application as follows:

Amendments to the Claims are reflected in the listing of claims which begins on the page entitled "Amendments to the Claims."

Remarks begin on the page entitled "Remarks."

Amendments to the Claims

This listing of claims replaces all prior versions, and listings, of claims in the above-identified application:

1. (Currently Amended) A dental article form comprising an organic composition in the form of a self-supporting structure having a first shape and sufficient malleability to be formed into a second shape, wherein the organic composition is dimensionally stable and comprises a surfactant system mixed therein, and wherein the dental article form comprises a reservoir that is capable of being filled with one or more hardenable dental materials and removed after at least partially hardening the dental material to form a dental article.
2. (Original) The dental article form of claim 1 wherein the organic composition is curable.
3. (Original) The dental article form of claim 2 wherein the curable organic composition comprises an initiator system and a resin system comprising at least one ethylenically unsaturated component.
4. (Original) The dental article form of claim 1 wherein the organic composition is noncurable.
5. (Original) The dental article form of claim 4 wherein the noncurable organic composition comprises a noncurable polymer selected from the group consisting of a polycaprolactone, a polyvinylacetate, an ethylene-vinyl acetate copolymer, a polyethylene glycol, a wax, and mixtures thereof.
6. (Original) The dental article form of claim 1 wherein the organic composition comprises a filler system.

7. (Original) The dental article form of claim 6 wherein the filler system comprises fibers, particulate filler, or mixtures thereof.
8. (Original) The dental article form of claim 6 wherein the filler system comprises an inorganic material comprising nanoscopic particles.
9. (Original) The dental article form of claim 8 wherein the inorganic material comprises surface hydroxyl groups.
10. (Canceled)
11. (Original) The dental article form of claim 1 which is a form for a dental article selected from the group consisting of a crown, an inlay, an onlay, a bridge, an orthodontic appliance, a maxillofacial prosthesis, and a tooth splint.
12. (Previously Presented) The dental article form of claim 1 wherein the reservoir contains the one or more hardenable dental materials.
13. (Original) The dental article form of claim 1 which is in packaging.
14. (Original) The dental article form of claim 13 wherein the packaging is light-blocking packaging.
15. (Original) The dental article form of claim 1 comprising one or more of the following features: a handle attached to the dental article form at a location removed from the base of the dental article form; a vented handle through which excess amounts of hardenable dental material

can pass during placement of the dental article form; and one or more lines of weakness that may be separated to remove the dental article form from dental material after placement of the dental article form.

16. (Currently Amended) A dental article form comprising a noncurable organic composition in the form of a self-supporting structure having a first shape and sufficient malleability to be formed into a second shape, wherein the organic composition is dimensionally stable and comprises a surfactant system mixed therein, and wherein the dental article form comprises a reservoir that is suitable for being filled with one or more hardenable dental materials.
17. (Original) The dental article form of claim 16 wherein the noncurable organic composition comprises a noncurable polymer selected from the group consisting of a polycaprolactone, a polyvinylacetate, an ethylene-vinyl acetate copolymer, a polyethylene glycol, a wax, and mixtures thereof.
18. (Original) The dental article form of claim 16 wherein the noncurable organic composition comprises a filler system.
19. (Original) The dental article form of claim 18 wherein the filler system comprises fibers, particulate filler, or mixtures thereof.
20. (Original) The dental article form of claim 18 wherein the filler system comprises an inorganic material comprising nanoscopic particles.
21. (Original) The dental article form of claim 20 wherein the inorganic material comprises surface hydroxyl groups.

22. (Original) The dental article form of claim 16 which is a form for a dental article selected from the group consisting of a crown, an inlay, an onlay, a bridge, an orthodontic appliance, a maxillofacial prosthesis, and a tooth splint.
23. (Original) The dental article form of claim 16 comprising a reservoir containing one or more hardenable dental materials.
24. (Original) The dental article form of claim 16 which is nonremovable.
25. (Original) The dental article form of claim 16 which is in packaging.
26. (Original) The dental article form of claim 16 which is removable after at least partially hardening the dental material to form a dental article.
27. (Original) The dental article form of claim 16 comprising one or more of the following features: a handle attached to the dental article form at a location removed from the base of the dental article form; a vented handle through which excess amounts of hardenable dental material can pass during placement of the dental article form; and one or more lines of weakness that may be separated to remove the dental article form from dental material after placement of the dental article form.
28. (Currently Amended) A dental article form comprising an organic composition free of added filler in the form of a self-supporting structure having a first shape and sufficient malleability to be formed into a second shape, wherein the organic composition is dimensionally stable and comprises a surfactant system mixed therein, and wherein the dental article form comprises a reservoir that is suitable for being filled with one or more hardenable dental materials.

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29. (Original) The dental article form of claim 28 wherein the organic composition free of added filler is curable.
30. (Original) The dental article form of claim 29 wherein the curable organic composition comprises an initiator system and a resin system comprising at least one ethylenically unsaturated component.
31. (Original) The dental article form of claim 28 wherein the organic composition free of added filler is noncurable.
32. (Original) The dental article form of claim 30 wherein the noncurable organic composition comprises a noncurable polymer selected from the group consisting of a polycaprolactone, a polyvinylacetate, an ethylene-vinyl acetate copolymer, a polyethylene glycol, a wax, and mixtures thereof.
33. (Original) The dental article form of claim 28 which is nonremovable.
34. (Previously Presented) The dental article form of claim 28 wherein the reservoir contains one or more hardenable dental materials.
35. (Original) The dental article form of claim 28 which is a form for a dental article selected from the group consisting of a crown, an inlay, an onlay, a bridge, an orthodontic appliance, a maxillofacial prosthesis, and a tooth splint.
36. (Original) The dental article form of claim 28 which is in packaging.

37. (Original) The dental article form of claim 28 which is removable after hardening the dental material to form a dental article.

38. (Original) The dental article form of claim 28 comprising one or more of the following features: a handle attached to the dental article form at a location removed from the base of the dental article form; a vented handle through which excess amounts of hardenable dental material can pass during placement of the dental article form; and one or more lines of weakness that may be separated to remove the dental article form from dental material after placement of the dental article form.

39. (Currently Amended) A method of preparing a dental article, the method comprising:
selecting a dental article form having a reservoir and comprising an organic composition in the form of a self-supporting structure having a first shape and sufficient malleability to be formed into a second shape, wherein the organic composition is dimensionally stable and comprises a surfactant system mixed therein;

filling the reservoir with one or more hardenable dental materials;

placing the dental article form filled with one or more hardenable dental materials on a subject's tooth structure;

at least partially hardening the hardenable material to form the dental article;

optionally customizing the dental article outside of the subject's mouth;

cementing the dental article to the subject's tooth structure; and

removing the dental article form from the article;

wherein the dental article form is reshaped while in the subject's mouth before or after filling the reservoir with the hardenable dental material.

40. (Canceled)

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41. (Canceled)
42. (Previously Presented) The method of claim 39 wherein the organic composition is curable.
43. (Original) The method of claim 42 wherein the curable organic composition comprises an initiator system and a resin system comprising at least one ethylenically unsaturated component.
44. (Previously Presented) The method of claim 39 wherein the organic composition is noncurable.

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Remarks

The Office Action mailed 27 June 2006 has been received and reviewed as well as the Advisory Action dated 16 October 2006. Claims 1, 16, 28, and 39 having been amended, claims 1-9, 11-39, and 42-44 remain pending. Reconsideration and withdrawal of the rejections are respectfully requested.

Interview Summary and Advisory Action

Applicants thank the Examiner for the courtesy extended during the telephone conference on 27 October 2006 between Examiner Wilson and Applicants' Representative, Ann Mueiting. During the telephone conference, the definition of self-supporting in the specification and possible claim amendments were discussed.

Applicants thank the Examiner for acknowledging that the drawing and specification amendments are accepted, and that the rejection of claims 39 and 42-44 under 35 U.S.C. §103(a) and claim 18 under 35 U.S.C. §112, second paragraph rejections have been overcome. Since the Examiner did not reference the 35 U.S.C. §103(a) rejection of claims 1-9, 11-39, and 42-44 over Simor in view of Neustadter, Ivanov et al., and Wilson, Applicants believe that this rejection has also been overcome. Notification to this effect is respectfully requested.

Obviousness-Type Double Patenting Rejection

Claims 1-9, 11-39, and 42-44 were provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-78 of copending Application No. 10/219,398 in view of Neustadter (U.S. Patent No. 3,565,387). Upon an indication of otherwise allowable subject matter and in the event this rejection is maintained, Applicants will provide an appropriate response.

Applicants' Invention

Each of Applicants' claims recites a dental article form that includes an organic composition (including a surfactant system mixed therein) in the form of a self-supporting structure having a first shape and sufficient malleability to be formed into a second shape. This is describing the organic composition that is used to make the dental article form (as opposed to the hardenable dental material that is placed within the reservoir of the dental article form).

The term "self-supporting" means that the composition is dimensionally stable and will maintain its shape (e.g., preformed shape of a crown form) without significant deformation at room temperature (i.e., about 20°C to about 25°C) for at least about two weeks when free-standing (i.e., without the support of packaging or a container). Preferably, the compositions of the present invention are dimensionally stable at room temperature for at least about one month, and more preferably, for at least about six months. Preferably, the compositions of the present invention are dimensionally stable at temperatures above room temperature, more preferably up to about 40°C, even more preferably up to about 50°C, and even more preferably up to about 60°C. This definition applies in the absence of conditions that activate an initiator system (if present) and in the absence of an external force other than gravity.

The term "sufficient malleability" means that the self-supporting structure is capable of being custom shaped and fitted, for example, to a patient's mouth, under a moderate force (i.e., a force that ranges from light finger pressure to that applied with manual operation of a small hand tool, such as a dental composite instrument). Herein, the phrase "malleable" refers to a material that is malleable under conditions in the mouth or that can be comfortably withstood by oral tissue (e.g., temperature and/or oral fluids, including water).

The 35 U.S.C. §103 Rejections

The Examiner rejected claims 1-9, 11, 12, 16-24, 26, 28-35, and 37 under 35 U.S.C. §103(a) as being unpatentable over Kennedy (U.S. Patent No. 4,129,946) in view of Neustadter et al. (U.S. Patent No. 3,565,387) and Ivanov et al. (U.S. Patent No. 4,113,499). The Examiner

rejected claims 13, 14, 25, and 36 under 35 U.S.C. §103(a) as being unpatentable over Kennedy (U.S. Patent No. 4,129,946) in view of Neustadter et al. (U.S. Patent No. 3,565,387) and Ivanov et al. (U.S. Patent No. 4,113,499) as applied to claims 1, 16, and 28 above, and further in view of Uthoff (U.S. Patent No. 5,102,332). The Examiner rejected claims 15, 27, and 38 under 35 U.S.C. §103(a) as being unpatentable over Kennedy (U.S. Patent No. 4,129,946) in view of Neustadter et al. (U.S. Patent No. 3,565,387) and Ivanov et al. (U.S. Patent No. 4,113,499) as applied to claims 1, 16, and 28 above, and further in view of Kahn (U.S. Patent No. 3,949,476). These rejections are respectfully traversed.

The combination of the three documents, Kennedy in view of Neustadter et al. and Ivanov et al., does not teach or suggest Applicants' claimed invention. That is, the combination of the three documents does not teach or suggest a dental article form having all of the recited characteristics. For example, the combination of the three documents does not provide a dental article form that is both self-supporting and malleable and includes a reservoir that is capable of being filled with one or more hardenable dental materials. Thus, it is respectfully submitted that this combination of documents does not provide a prima facie case of obviousness.

Although Neustadter et al. may define a malleable material, Kennedy does not disclose a "self-supporting" dental article form, as defined by Applicants' specification at page 5, lines 3-7 ("The term "self-supporting" means that the composition is dimensionally stable and will maintain its shape (e.g., preformed shape of a crown form) without significant deformation at room temperature (i.e., about 20°C to about 25°C) for at least about two weeks when free-standing (i.e., without the support of packaging or a container)."). Although the material of the dental crown form of Kennedy (co-polyester plastic) is described as not deforming and slumping as readily as previously used materials (see column 3, lines 36-39), Kennedy describes the need for a "stiffening flange 20" that "substantially strengthens the relatively thin structure of the tooth form, and prevents unwanted deformation of the form during storage and handling" (see column 3, lines 33-36). Thus, although the dental crown form of Kennedy is more "self-supporting" than previously used materials, Kennedy does not teach or suggest a dental article form wherein the

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organic composition is dimensionally stable under the conditions described by Applicants without support of packaging or a container. See, e.g., page 5, lines 3-7. Applicants have amended the claims to clarify the invention.

Thus, it is respectfully submitted that these 103 rejections be withdrawn.

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Summary

It is respectfully submitted that the pending claims 1-9, 11-39, and 42-44 are in condition for allowance and notification to that effect is respectfully requested. The Examiner is invited to contact Applicants' Representatives, at the below-listed telephone number, if it is believed that prosecution of this application may be assisted thereby.

Respectfully submitted

By

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October 27, 2006
Date

By: Ann M. Mueting
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CERTIFICATE UNDER 37 C.F.R. §1.8: The undersigned hereby certifies that this Facsimile Cover Sheet and the paper(s), as described hereinabove, are being transmitted by facsimile in accordance with 37 CFR §1.6(d) to the Patent and Trademark Office addressed to the **Mail Stop RCE**, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on this 27th day of October, 2006, at 4:45 pm (Central Time).

October 27, 2006
Date

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Name: Sue Dombroske



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PATENT

Docket No. 58614US002

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s): Joel D. OXMAN et al.	)	Group Art Unit: 3732
)	
Serial No.: 10/643,748	)	Examiner: John J. Wilson
Confirmation No.: 4133)	
)	
Filed: 19 August 2003)	
)	
For: <u>DENTAL ARTICLE FORMS AND METHODS</u>		

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Please Note: Deposit Account authorized for debit of \$120 Extension fee and \$790 RCE fee.

Please consider this a PETITION FOR EXTENSION OF TIME for a sufficient number of months to enter these papers and please charge any additional fees or credit overpayment to Deposit Account No. 13-4895.

Date

October 27, 2006

Mueiting, Raasch & Gebhardt, P.A.

By: Ann M. Mueiting
 Ann M. Mueiting
 Reg. No. 33.977



PATENT
Docket No. 58614US002

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s): Joel D. OXMAN et al.	)	Group Art Unit:	3732
)		
Serial No.: 10/643,748	)	Examiner: John J. Wilson	
Confirmation No.: 4133)		
)		
Filed: 19 August 2003)		
)		
For: DENTAL ARTICLE FORMS AND METHODS)		

AMENDMENT AND RESPONSE

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

In response to the Office Action mailed 5 December 2006, please amend the above-identified application as follows:

Amendments to the Claims are reflected in the listing of claims which begins on the page entitled "Amendments to the Claims."

Remarks begin on the page entitled "Remarks."

Amendments to the Claims

This listing of claims replaces all prior versions, and listings, of claims in the above-identified application:

1-38. (Canceled)

39. **(Previously Presented)** A method of preparing a dental article, the method comprising:
selecting a dental article form having a reservoir and comprising an organic composition in the form of a self-supporting structure having a first shape and sufficient malleability to be formed into a second shape, wherein the organic composition is dimensionally stable and comprises a surfactant system mixed therein;
filling the reservoir with one or more hardenable dental materials;
placing the dental article form filled with one or more hardenable dental materials on a subject's tooth structure;
at least partially hardening the hardenable material to form the dental article;
optionally customizing the dental article outside of the subject's mouth;
cementing the dental article to the subject's tooth structure; and
removing the dental article form from the article;
wherein the dental article form is reshaped while in the subject's mouth before or after filling the reservoir with the hardenable dental material.

40-41. (Canceled)

42. **(Previously Presented)** The method of claim 39 wherein the organic composition is curable.

43. **(Original)** The method of claim 42 wherein the curable organic composition comprises

an initiator system and a resin system comprising at least one ethylenically unsaturated component.

44. **(Previously Presented)** The method of claim 39 wherein the organic composition is noncurable.
45. **(New)** A method of preparing a dental article, the method comprising:
- selecting a dental article form having a reservoir and comprising an organic composition in the form of a self-supporting structure having a first shape and sufficient malleability to be formed into a second shape;
 - filling the reservoir with one or more hardenable dental materials;
 - placing the dental article form filled with one or more hardenable dental materials on a subject's tooth structure;
 - at least partially hardening the hardenable material in the reservoir to form the dental article;
 - optionally customizing the dental article outside of the subject's mouth;
 - cementing the dental article to the subject's tooth structure; and
 - removing the dental article form from the dental article;
- wherein the dental article form is reshaped while in the subject's mouth before or after filling the reservoir with the hardenable dental material.
46. **(New)** The method of claim 45 wherein the dental article form is removed after the dental article is cemented to the subject's tooth structure.
47. **(New)** The method of claim 45 wherein the dental article form comprises an organic composition comprising a surfactant system mixed therein.

48. (New) The method of claim 45 wherein the organic composition comprises a filler system.
49. (New) The method of claim 45 wherein the organic composition is free of added filler.
50. (New) The method of claim 45 wherein the organic composition is curable or noncurable.
51. (New) The method of claim 50 wherein the organic composition is curable.
52. (New) The method of claim 51 wherein the curable organic composition comprises an initiator system and a resin system comprising at least one ethylenically unsaturated component.
53. (New) The method of claim 50 wherein the organic composition is noncurable.
54. (New) The method of claim 53 wherein the noncurable organic composition comprises a noncurable polymer selected from the group consisting of a polycaprolactone, a polyvinylacetate, and ethylene-vinyl acetate copolymer, a polyethylene glycol, a wax, and mixtures thereof.
55. (New) The method of claim 45 wherein the dental article form is a form for a dental article selected from the group consisting of a crown, an inlay, an onlay, a bridge, an orthodontic appliance, a maxillofacial prosthesis, and a tooth splint.
56. (New) The method of claim 45 wherein the dental article form is in packaging.
57. (New) The method of claim 45 wherein the dental article form comprises one or more of

the following features: a handle attached to the dental article form at a location removed from the base of the dental article form; a vented handle through which excess amounts of hardenable dental material can pass during placement of the dental article form; and one or more lines of weakness that may be separated.

58. (New) A method of preparing a dental article, the method comprising:
- selecting a dental article form having a reservoir and comprising an organic composition in the form of a self-supporting structure having a first shape and sufficient malleability to be formed into a second shape;
 - filling the reservoir with one or more hardenable dental materials;
 - placing the dental article form filled with one or more hardenable dental materials on a subject's tooth structure;
 - hardening the hardenable material in the reservoir to form the dental article and cement it to the subject's tooth structure; and
 - removing the dental article form from the dental article;
- wherein the dental article form is reshaped while in the subject's mouth before or after filling the reservoir with the hardenable dental material.
59. (New) The method of claim 58 wherein the dental article form comprises an organic composition comprising a surfactant system mixed therein.
60. (New) The method of claim 58 wherein the organic composition is curable or noncurable.
61. (New) The method of claim 60 wherein the organic composition is curable.
62. (New) The method of claim 61 wherein the curable organic composition comprises an initiator system and a resin system comprising at least one ethylenically unsaturated

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component.

63. **(New)** The method of claim 60 wherein the organic composition is noncurable.
64. **(New)** The method of claim 63 wherein the noncurable organic composition comprises a noncurable polymer selected from the group consisting of a polycaprolactone, a polyvinylacetate, and ethylene-vinyl acetate copolymer, a polyethylene glycol, a wax, and mixtures thereof.

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Remarks

The Office Action mailed 5 December 2006 has been received and reviewed. Claims 1-9 and 11-38 having been canceled, without prejudice, and claims 45-64 having been added, the pending claims are claims 39 and 42-64. Reconsideration and withdrawal of the rejections are respectfully requested.

New claims 45-64 are supported, for example, by the originally filed claims and at page 12, lines 19-29 of the specification.

The 35 U.S.C. §103(a) Rejections

The Examiner rejected claims 1-9, 11-12, 16, 24, 26, 28-35, and 37 under 35 U.S.C. §103(a) as being unpatentable over Kennedy (U.S. Patent No. 4,129,946) in view of Neustadter (U.S. Patent No. 3,565,387) and Ivanov et al. (U.S. Patent No. 4,113,499). Claims 1-9, 11-12, 16, 24, 26, 28-35, and 37 having been canceled, the rejection has been rendered moot. Applicants respectfully request reconsideration and withdrawal of the rejection under 35 U.S.C. §103(a).

The Examiner also rejected claims 13-14, 25, and 36 under 35 U.S.C. §103(a) as being unpatentable over Kennedy (U.S. Patent No. 4,129,946) in view of Neustadter (U.S. Patent No. 3,565,387) and Ivanov et al. (U.S. Patent No. 4,113,499) as applied to claims 1, 16, and 28 above, and further in view of Uthoff (U.S. Patent No. 5,102,332). Claims 13-14, 25, and 36 having been canceled, the rejection has been rendered moot. Applicants respectfully request reconsideration and withdrawal of the rejection under 35 U.S.C. §103(a).

The Examiner rejected claims 15, 27, and 38 under 35 U.S.C. §103(a) as being unpatentable over Kennedy (U.S. Patent No. 4,129,946) in view of Neustadter (U.S. Patent No. 3,565,387) and Ivanov et al. (U.S. Patent No. 4,113,499) as applied to claims 1, 16, and 28 above, and further in view of Kahn (U.S. Patent No. 3,949,476). Claims 15, 27, and 38 having

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been canceled, the rejection has been rendered moot. Applicants respectfully request reconsideration and withdrawal of the rejection under 35 U.S.C. §103(a).

The Examiner rejected claims 39 and 42-44 under 35 U.S.C. §103(a) as being unpatentable over Simor (U.S. Patent No. 3,585,723) in view of Neustadter (U.S. Patent No. 3,565,387), Ivanov (U.S. Patent No. 4,113,499), and Wilson (U.S. Patent No. 5,487,663). Applicants respectfully traverse this rejection.

The Examiner alleged that "claims . . . 39 claim an article comprising a compound, and as such, does not limit the actual article to include the other structure" (e.g., page 6, Non-Final Office Action mailed 5 December 2006). Applicants disagree.

Applicants submit that claim 39 recites a method of preparing a dental article.

"To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations." M.P.E.P. §2143.

Applicants reiterate that, among other deficiencies, claims 39 and 42-44 are not obvious by the combination of the four documents because such documents do not teach each and every aspect of the claimed invention. For example, in the Amendment and Response of 12 September 2006 (which is incorporated herein by reference), Applicants noted that the combination of the four documents does not teach or suggest a method of making a dental article having all the recited steps, including using a dental article form having all of the recited characteristics. Further, Applicants noted that there is no motivation to combine the cited four documents. Even if there were such motivation to combine these four documents, one skilled in the art would have no reasonable expectation whatsoever that the disclosure of Simor combined with the disclosures of Neustadter et al. and Ivanov et al. and Wilson would necessarily provide the method recited in

claim 39. While Applicants believe that the previously submitted arguments are sufficient to overcome the rejection, the following additional remarks are presented herein in an effort to further prosecution of this matter.

Although Neustadter et al. may define a malleable material, Simor does not teach a dental article form comprising an organic composition having a surfactant system mixed therein.

Although Ivanov et al. disclose a surfactant mixed in a disposable mold form, Ivanov et al. is directed to molds used in the foundry industry, a completely nonanalogous technology area.

The Examiner acknowledged that this combination of three documents (Simor in view of Neustadter et al. and Ivanov et al.) does not teach or suggest each of the steps recited in Applicants' claimed method (*see, e.g.,* page 4, Non-Final Office Action mailed 5 December 2006). Thus, the Examiner cited Wilson for a disclosure of removing the dental article form from the dental article; however, Wilson does not teach that the dental article form that is self-supporting and malleable. Thus, it is respectfully submitted that there is no motivation to combine the cited four documents.

Even if there were such motivation to combine these four documents, one skilled in the art would have no reasonable expectation whatsoever that the disclosure of Simor combined with the disclosures of Neustadter et al. and Ivanov et al. and Wilson would necessarily provide the method recited in claim 39.

It is submitted that this rejection may only be made by impermissible hindsight reconstruction, that is, by picking and choosing from each document that which supports these rejections. One cannot "simply [to] engage in a hindsight reconstruction of the claimed invention, using the Applicant's structure as a template and selecting elements from references to fill the gaps." *In re Gorman*, 933 F.2d 982, 18 U.S.P.Q.2d 1885, 1888 (Fed. Cir. 1991). As the Examiner required the combination of four separate documents in the rejection, Applicants submit that this rejection could only have been made by means of impermissible hindsight reconstruction.

As recently asserted in *Princeton Biochemicals, Inc. v. Beckman Coulter, Inc.* 411 F.3d 1332, 75 U.S.P.Q.2d 1051 (Fed. Cir. 2005), 35 U.S.C. §103 specifically requires an assessment of the claimed invention “as a whole.” The “as a whole” assessment of the invention requires a showing that an artisan of ordinary skill in the art at the time of the invention, confronted by the same problems as the inventor and with no knowledge of the claimed invention, would have selected the various elements from the cited references and combined them in the claimed manner. In other words, 35 U.S.C. §103 requires some suggestion or motivation, before the invention itself, to make the new combination. See *In re Rouffet*, 149 F.3d 1350, 1355-56, 47 U.S.P.Q.2d 1453, 1457-58 (Fed. Cir. 1998).

This “as a whole” instruction in 35 U.S.C. §103 prevents evaluation of the invention part by part. Without this important requirement, an obviousness assessment might successfully break an invention into its component parts, then find a reference corresponding to each component. This line of reasoning would import hindsight into the obviousness determination by using the invention as a roadmap to find its prior art components. Further, this improper method would discount the value of combining various existing features or principles in a new way to achieve a new result - often the essence of the invention. *Ruiz v. A.B. Chance Co.*, 357 F.3d 1270, 1275, 69 U.S.P.Q.2d 1686, 1690 (Fed. Cir. 2004). Simply identifying the various elements of a claim in the cited reference does not render a claim obvious. *Ruiz*, 357 F.3d at 1275. Instead, 35 U.S.C. §103 requires some suggestion or motivation in the prior art to make the new combination. *In re Rouffet*, 149 F.3d at 1355-56. Applicants submit that the Examiner has engaged in an improper part by part analysis of the claimed invention.

As such, Applicants respectfully submit that claims 39 and 42-44 are not obvious over the combination of Simor in view of Neustadter, Ivanov, and Wilson. Applicants respectfully requests reconsideration and withdrawal of the rejection under 35 U.S.C. §103(a).

Obviousness-Type Double Patenting Rejection

The Examiner rejected claims 1-9, 11-39, and 42-44 as provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-54, 56-73, 75, and 79-83 of copending Application No. 10/219,398 in view of Neustadter (U.S. Patent No. 3,565,387). Claims 1-9 and 11-38 have been cancelled. However, to the extent the rejection applies to claims 39 and 42-44, Applicants respectfully traverse this rejection.

"To establish a *prima facie* case of obviousness . . . the prior art reference (or references when combined) must teach or suggest all the claim limitations." M.P.E.P. §2143.

Applicants respectfully submit that the cited documents do not teach or suggest all of the language recited in the present claims. For example, the method claims of copending Application No. 10/219,398 recite, among other things, various methods of preparing a dental product, the methods comprising: providing a composition comprising a resin system, a filler system, and an initiator system; forming the self-supporting, malleable structure into a second shape; and hardening the self-supporting structure having the second shape to form a dental product (*see, e.g.,* independent claims 71 and 73). Further, the Examiner stated that the "claims of the '398 application teach using an organic composition that is self-supporting and malleable, however, do not show using a form that is capable of being filled" (*e.g.,* page 4, Non-Final Office Action mailed 5 December 2006). However, Applicants submit that the method claims of copending Application No. 10/219,398 do not recite a method wherein the "dental article form is reshaped while in the subject's mouth before or after filling the reservoir with the hardenable dental material" (*e.g.,* independent claim 39).

Further, Applicants respectfully submit that the claims of Neustadter do not disclose subject matter that would correct the deficiencies of the method claims of copending Application No. 10/219,398 noted herein above.

As such, Applicants respectfully submit that pending claims 39 and 42-44 are not obvious over the combination of claims 1-54, 56-73, 75, and 79-83 of copending Application No.

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10/219,398 in view of Neustadter. Applicants respectfully request reconsideration and withdrawal of the rejection under the doctrine of obviousness-type double patenting.

New Claims

New independent claim 45 recites, among other things, a method of preparing a dental article, the method comprising: selecting a dental article form having a reservoir and comprising an organic composition in the form of a self-supporting structure having a first shape and sufficient malleability to be formed into a second shape; filling the reservoir with one or more hardenable dental materials; placing the dental article form filled with one or more hardenable dental materials on a subject's tooth structure; at least partially hardening the hardenable material in the reservoir to form the dental article; optionally customizing the dental article outside of the subject's mouth; cementing the dental article to the subject's tooth structure; and removing the dental article form from the dental article; wherein the dental article form is reshaped while in the subject's mouth before or after filling the reservoir with the hardenable dental material.

New claims 46-58 provide further definition of the dental article form (claims 46-47 and 55-57), and further definition of the organic composition (claims 48-54).

New independent claim 58 recites, among other things, a method of preparing a dental article, the method comprising: selecting a dental article form having a reservoir and comprising an organic composition in the form of a self-supporting structure having a first shape and sufficient malleability to be formed into a second shape; filling the reservoir with one or more hardenable dental materials; placing the dental article form filled with one or more hardenable dental materials on a subject's tooth structure; hardening the hardenable material in the reservoir to form the dental article and cement it to the subject's tooth structure; and removing the dental article form from the dental article; wherein the dental article form is reshaped while in the subject's mouth before or after filling the reservoir with the hardenable dental material.

New claims 59-64 provide further definition of the dental article form (claim 59), and further definition of the organic composition (claims 60-64).

Amendment and Response

Serial No.: 10/643,748

Page 13 of 14

Confirmation No.: 4133

Filed: 19 August 2003

For: DENTAL ARTICLE FORMS AND METHODS

No new matter has been added. Entry and consideration of the new claims are respectfully requested.

Amendment and Response

Serial No.: 10/643,748

Confirmation No.: 4133

Filed: 19 August 2003

For: DENTAL ARTICLE FORMS AND METHODS

Page 14 of 14

Summary

It is respectfully submitted that all the pending claims are in condition for allowance and notification to that effect is respectfully requested. The Examiner is invited to contact Applicants' Representatives, at the below-listed telephone number, if it is believed that prosecution of this application may be assisted thereby.

Respectfully submitted

By

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Date January 16, 2007

By: Ann M. Mueting

Ann M. Mueting

Reg. No. 33,977

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MUEITING RAASCH GEBHARDT

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PATENT

Docket No. 58614US002

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s): Joel D. OXMAN et al.) Group Art Unit: 3732
 Serial No.: 10/643,748) Examiner: John J. Wilson
 Confirmation No.: 4133)
 Filed: 19 August 2003)
 For: DENTAL ARTICLE FORMS AND METHODS

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January 16, 2007
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16 January 2007
 Date

Signature: R. Gayle
 Name: R. Gayle
 R. Gayle

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PATENT
Docket No. 58614US002

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s): Joel D. OXMAN et al.)
Serial No.: 10/643,748)
Confirmation No.: 4133)
Filed: 19 August 2003)
For: DENTAL ARTICLE FORMS AND METHODS)

Group Art Unit: 3732
Examiner: John J. Wilson

FACSIMILE TRANSMISSION TO THE PTO

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Commissioner for Patents
P.O. Box 1450
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Mueting, Raasch & Gebhardt, P.A.

January 16, 2007
Date

By: Ann M. Mueting
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16 January 2007
Date

Signature: R. Gagliardi
Name: R. Gagliardi

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PATENT
Docket No. 58614US002

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s): Joel D. OXMAN et al.	)	Group Art Unit: 3732
)	
Serial No.: 10/643,748	)	Examiner: John J. Wilson
Confirmation No.: 4133)	
)	
Filed: 19 August 2003)	
)	
For: <u>DENTAL ARTICLE FORMS AND METHODS</u>		

AMENDMENT AND RESPONSE

Commissioner for Patents
Mail Stop RCE
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

In response to the Office Action mailed 11 May 2007, please amend the above-identified application as follows:

Amendments to the Claims are reflected in the listing of claims which begins on the page entitled "Amendments to the Claims."

Remarks begin on the page entitled "Remarks."

Amendments to the Claims

This listing of claims replaces all prior versions, and listings, of claims in the above-identified application:

1-38. (Cancelled)

39. (Currently Amended) A method of preparing a dental article, the method comprising:
- selecting a dental article form having a self-supporting structure comprising a first shape that includes a reservoir, and comprising wherein the self-supporting structure is formed from an organic composition in the form of a self-supporting structure having a first shape and sufficient malleability to be formed into a second shape, wherein the organic composition gives the self-supporting structure its self-supporting and malleable characteristics, and further wherein the organic composition is dimensionally stable and comprises a surfactant system mixed therein;
 - filling the reservoir with one or more hardenable dental materials;
 - placing the dental article form filled with one or more hardenable dental materials on a subject's tooth structure;
 - at least partially hardening the hardenable material to form the dental article;
 - optionally customizing the dental article outside of the subject's mouth;
 - cementing the dental article to the subject's tooth structure; and
 - removing the dental article form from the article;
- wherein the dental article form is reshaped while in the subject's mouth before or after filling the reservoir with the hardenable dental material.

40-41. (Cancelled)

42. (Previously Presented) The method of claim 39 wherein the organic composition is curable.

43. **(Original)** The method of claim 42 wherein the curable organic composition comprises an initiator system and a resin system comprising at least one ethylenically unsaturated component.
44. **(Previously Presented)** The method of claim 39 wherein the organic composition is noncurable.
45. **(Currently Amended)** A method of preparing a dental article, the method comprising:
selecting a dental article form having a self-supporting structure comprising a first shape that includes a reservoir, and comprising wherein the self-supporting structure is formed from an organic composition in the form of a self-supporting structure having a first shape and sufficient malleability to be formed into a second shape, wherein the organic composition gives the self-supporting structure its self-supporting and malleable characteristics;
filling the reservoir with one or more hardenable dental materials;
placing the dental article form filled with one or more hardenable dental materials on a subject's tooth structure;
at least partially hardening the hardenable material in the reservoir to form the dental article;
optionally customizing the dental article outside of the subject's mouth;
cementing the dental article to the subject's tooth structure; and
removing the dental article form from the dental article;
wherein the dental article form is reshaped while in the subject's mouth before or after filling the reservoir with the hardenable dental material.
46. **(Previously Presented)** The method of claim 45 wherein the dental article form is removed after the dental article is cemented to the subject's tooth structure.

47. **(Previously Presented)** The method of claim 45 wherein the dental article form comprises an organic composition comprising a surfactant system mixed therein.
48. **(Previously Presented)** The method of claim 45 wherein the organic composition comprises a filler system.
49. **(Previously Presented)** The method of claim 45 wherein the organic composition is free of added filler.
50. **(Previously Presented)** The method of claim 45 wherein the organic composition is curable or noncurable.
51. **(Previously Presented)** The method of claim 50 wherein the organic composition is curable.
52. **(Previously Presented)** The method of claim 51 wherein the curable organic composition comprises an initiator system and a resin system comprising at least one ethylenically unsaturated component.
53. **(Previously Presented)** The method of claim 50 wherein the organic composition is noncurable.
54. **(Previously Presented)** The method of claim 53 wherein the noncurable organic composition comprises a noncurable polymer selected from the group consisting of a polycaprolactone, a polyvinylacetate, and ethylene-vinyl acetate copolymer, a polyethylene glycol, a wax, and mixtures thereof.

55. **(Previously Presented)** The method of claim 45 wherein the dental article form is a form for a dental article selected from the group consisting of a crown, an inlay, an onlay, a bridge, an orthodontic appliance, a maxillofacial prosthesis, and a tooth splint.
56. **(Previously Presented)** The method of claim 45 wherein the dental article form is in packaging.
57. **(Previously Presented)** The method of claim 45 wherein the dental article form comprises one or more of the following features: a handle attached to the dental article form at a location removed from the base of the dental article form; a vented handle through which excess amounts of hardenable dental material can pass during placement of the dental article form; and one or more lines of weakness that may be separated.
58. **(Currently Amended)** A method of preparing a dental article, the method comprising:
selecting a dental article form having a self-supporting structure comprising a first shape that includes a reservoir, and comprising wherein the self-supporting structure is formed from an organic composition in the form of a self-supporting structure having a first shape and sufficient malleability to be formed into a second shape, wherein the organic composition gives the self-supporting structure its self-supporting and malleable characteristics;
filling the reservoir with one or more hardenable dental materials;
placing the dental article form filled with one or more hardenable dental materials on a subject's tooth structure;
hardening the hardenable material in the reservoir to form the dental article and cement it to the subject's tooth structure; and
removing the dental article form from the dental article;
wherein the dental article form is reshaped while in the subject's mouth before or after filling the reservoir with the hardenable dental material.

59. **(Previously Presented)** The method of claim 58 wherein the dental article form comprises an organic composition comprising a surfactant system mixed therein.
60. **(Previously Presented)** The method of claim 58 wherein the organic composition is curable or noncurable.
61. **(Previously Presented)** The method of claim 60 wherein the organic composition is curable.
62. **(Previously Presented)** The method of claim 61 wherein the curable organic composition comprises an initiator system and a resin system comprising at least one ethylenically unsaturated component.
63. **(Previously Presented)** The method of claim 60 wherein the organic composition is noncurable.
64. **(Previously Presented)** The method of claim 63 wherein the noncurable organic composition comprises a noncurable polymer selected from the group consisting of a polycaprolactone, a polyvinylacetate, and ethylene-vinyl acetate copolymer, a polyethylene glycol, a wax, and mixtures thereof.
65. **(New)** A method of preparing a dental article, the method comprising:
selecting a dental article form having a self-supporting structure comprising a first shape that includes a reservoir, wherein the self-supporting structure is formed from an organic composition having sufficient malleability to be formed into a second shape, wherein the dental article form does not include slots;
filling the reservoir with one or more hardenable dental materials;

placing the dental article form filled with one or more hardenable dental materials on a subject's tooth structure;

at least partially hardening the hardenable material in the reservoir to form the dental article;

optionally customizing the dental article outside of the subject's mouth;

cementing the dental article to the subject's tooth structure; and

removing the dental article form from the dental article;

wherein the dental article form is reshaped while in the subject's mouth before or after filling the reservoir with the hardenable dental material.

66. **(New)** A method of preparing a dental article, the method comprising:

selecting a dental article form having a self-supporting structure comprising a first shape that includes a reservoir, wherein the self-supporting structure is formed from an organic composition having sufficient malleability to be formed into a second shape, wherein the dental article form does not include slots;

filling the reservoir with one or more hardenable dental materials;

placing the dental article form filled with one or more hardenable dental materials on a subject's tooth structure;

hardening the hardenable material in the reservoir to form the dental article and cement it to the subject's tooth structure; and

removing the dental article form from the dental article;

wherein the dental article form is reshaped while in the subject's mouth before or after filling the reservoir with the hardenable dental material.

Remarks

The Office Action mailed 11 May 2007 has been received and reviewed. Claims 39, 45, and 58 having been amended, claims 1-38, 40, and 41 having been previously cancelled (without prejudice), and claims 65-66 having been added, the pending claims are claims 39 and 42-66. Reconsideration and withdrawal of the rejections are respectfully requested.

Claims 39, 45, and 58 have been amended to include the clarifying language "selecting a dental article form having a self-supporting structure comprising a first shape that includes a reservoir, wherein the self-supporting structure is formed from an organic composition having sufficient malleability to be formed into a second shape, wherein the organic composition gives the self-supporting structure its self-supporting and malleable characteristics." The application as a whole supports this clarifying language.

New claims 65-66 include the clarifying language "selecting a dental article form having a self-supporting structure comprising a first shape that includes a reservoir, wherein the self-supporting structure is formed from an organic composition having sufficient malleability to be formed into a second shape, wherein the dental article form does not include slots." The application as a whole supports this language, since no slots are described or shown in the dental article forms.

It is respectfully requested that if the amended language is not acceptable and is the only issue preventing allowance, that the Examiner call the undersigned at 612-305-1217 as Applicants would be amenable to discussing language that would address the Examiner's concern regarding description of the composition.

Interview Summary

Applicants thank the Examiner for the time and consideration shown in the interview on 08 August 2007 with Applicants' Representative Ann Mueting and Inventor Dr. Naimul Karim. During the interview, Dr. Karim showed an example of a preformed dental crown made from a organic composition having a self-supporting structure and malleability analogous to the

composition of the dental article form encompassed by the claims of the present application, as well as a two-minute video demonstrating how the composition can be manipulated by a dentist.

The preformed dental crown that was shown is available from 3M Company under the product designation "Protemp Crown Temporization Material" (e.g., lower molar, large, catalog number 50612 PROTEMP Crown). Although the product shown was not a dental article form of the present invention, the organic composition that forms the preformed dental crown is the same type of organic composition that forms the dental article form of the present invention.

The two-minute video demonstrated how the preformed malleable crown (3M's PROTEMP Crown) is used clinically, analogous to how a dental article form of the present invention could be used. The organic composition of the crown is self-supporting and malleable when the dental professional removes it from its light-protected packaging, similar to a dental article form of the present invention. First, the video showed that the preformed crown is trimmed with ordinary crown scissors to proper length and then placed on a tooth stump that was previously prepared for a full crown, similar to how a dental article form of the present invention can be adjusted in length. Then the video showed how the dental professional uses his fingers and a simple composite instrument to adapt the crown all around the gingival margin and to establish proper contacts to both proximal teeth, similar to how a dental article form of the present invention can be adjusted. The video also showed how proper occlusal adjustment to the opposing teeth is made by letting the patient bite while the crown is in the malleable state and is still on the prepared tooth stump, similar to how a dental article form of the present invention can be adjusted. The video showed that the crown was partially cured for a few seconds with a hand held dental curing light, and then removed from the patient's mouth and fully cured for a minute with a hand held dental curing light. Dr. Karim explained that this latter step may or may not be done with the dental article form of the present invention, although the hardenable dental material placed in the reservoir of the dental article form could be similarly hardened.

Applicants discussed the art, particularly Neustadter et al. As the Examiner indicated in the Interview Summary, "Neustadter shows a form that requires a physical means, slit [sic], to change shape and does not show a composition that is malleable and self-supporting." It was

pointed out that although Neustadter et al. do describe a pattern made of plastic (e.g., polyvinyl acetate, polyethylene and copolymers thereof) (col. 2, lines 40-47), and that “[t]he plastic pattern should have the characteristic of (1) softness or pliability so that it can be adapted or modified by the technician and (2) retentivity so that it retains its modified shape,” it is not clear that these desired characteristics come from the choice of materials for making the pattern or from the use of the slot means in the design of the pattern, as discussed in greater detail below.

The Examiner appeared to appreciate the significance of the claim language describing Applicants’ invention relative to the prior art. However, the Examiner suggested that the claim language might be modified to more clearly indicate that the composition itself is self-supporting and malleable, rather than the structural design of the dental article form providing the self-supporting nature and malleability. Although Applicants believe the claim language says this and does not require further clarification, particularly in view of the specification, in the interest of expediting prosecution, amendments have been presented herein.

The 35 U.S.C. §103(a) Rejections

The Examiner rejected claims 39 and 42-44 under 35 U.S.C. §103(a) as being unpatentable over Simor (U.S. Patent No. 3,585,723) in view of Neustadter (U.S. Patent No. 3,565,387), Ivanov et al. (U.S. Patent No. 4,113,499) and Wilson (U.S. Patent No. 5,487,663). The Examiner rejected claims 45, 46, 48-55, 58, and 60-64 under 35 U.S.C. §103(a) as being unpatentable over Simor (U.S. Patent No. 3,585,723) in view of Neustadter (U.S. Patent No. 3,565,387) and Wilson (U.S. Patent No. 5,487,663). The Examiner rejected claims 47 and 59 under 35 U.S.C. §103(a) as being unpatentable over Simor (U.S. Patent No. 3,585,723) in view of Neustadter (U.S. Patent No. 3,565,387) and Wilson (U.S. Patent No. 5,487,663) as applied to claim 45, and further in view of Ivanov et al. (U.S. Patent No. 4,113,499). The Examiner rejected claim 56 under 35 U.S.C. §103(a) as being unpatentable over Simor (U.S. Patent No. 3,585,723) in view of Neustadter (U.S. Patent No. 3,565,387) and Wilson (U.S. Patent No. 5,487,663) as applied to claim 45, and further in view of Uthoff (U.S. Patent No. 5,102,332). The Examiner rejected claim 57 under 35 U.S.C. §103(a) as being unpatentable over Simor (U.S.

Patent No. 3,585,723) in view of Neustadter (U.S. Patent No. 3,565,387) and Wilson (U.S. Patent No. 5,487,663) as applied to claim 45 above, and further in view of Kahn (U.S. Patent No. 3,949,476).

Each of these rejections is traversed; however, in the interest of expediting prosecution, claims 39, 45, and 58 have been amended to clarify that the organic composition that forms the dental article form itself is self-supporting and malleable. Thus, these rejections are rendered moot. Insofar as the prior art applies to the presently pending claims, the following comments are provided.

Simor describe a crown, however, the major focus of the disclosure is on the use of metal as a material forming the crown to allow for reshaping by bending (e.g., bending the lower edge portion of the crown inwardly at col. 6, lines 55-58, or bending by the opposing occlusal surface at col. 8, lines 60-71). Brief reference is also made to the use of a plastic for forming the crown (e.g., col. 3, lines 68-72). However, the general term "plastic" can refer to a wide variety of materials, including those that are elastic and return to their original shape after deformation.

The Examiner uses Neustadter et al. for the disclosure of an organic composition for making a pattern for a dental article. Although Neustadter et al. do describe the use of a plastic such as "polyvinyl acetate, polyethylene and copolymers thereof" (col. 2, lines 45-47), which may or may not be malleable, and the desire to select materials having a shore A hardness of about 70 (col. 2, lines 56-57), which may or may not be malleable, there is no specific and enabling disclosure of an organic composition that is itself self-supporting and malleable.

Neustadter et al. describe dental patterns that include slot means for reshaping the pattern (e.g., col. 2, lines 11-16, "[t]he slot is relatively substantial width so that the width of the pattern can be narrowed sufficiently by pressing the edges together to partially or even fully close the slot the required amount to fit the prefabricated pattern into the space between the sides of the abutting or adjacent teeth"). Thus, Neustadter et al. show a form that requires a physical means, a slot, to change shape. With respect to the use of the plastic materials discussed above, Neustadter et al. state that "[t]he plastic pattern should have the characteristic of (1) softness or pliability so that it can be adapted or modified by the technician and (2) retentivity so that it

retains its modified shape” (col. 2, lines 52-55, emphasis added). Although this describes reshaping and retaining the shape, it is not clear that these desired characteristics come from the choice of materials for making the pattern (i.e., the selection of the plastic) or from the use of the slot means in the design of the pattern, particularly when the document is read as a whole. Simple reference to polyvinyl acetate, polyethylene and copolymers thereof does not necessarily provide sufficient description for one of skill in the art to select a composition that is both self-supporting and malleable. Thus, Neustadter et al. do not show a composition that is malleable and self-supporting.

Furthermore, the pattern of Neustadter et al. is not used in a patient’s mouth with a hardenable dental material in the reservoir. That is, there is no teaching or suggestion that “the dental article form is reshaped while in the subject’s mouth before or after filling the reservoir with the hardenable dental material,” as recited in each independent claim.

Although Ivanov et al. disclose a surfactant mixed in a disposable mold form, Ivanov et al. is directed to molds used in the foundry industry, a completely nonanalogous technology area.

The Examiner acknowledged that this combination of three documents (Simor in view of Neustadter et al. and Ivanov et al.) for the rejection of claims 39 and 42-44, or just the combination of Simor in view of Neustadter et al. for the rejection of claims 45-64, does not teach or suggest each of the steps recited in Applicants’ claimed method (e.g., pages 3 and 4, Final Office Action). Thus, the Examiner cited Wilson for a disclosure of removing the dental article form from the dental article; however, Wilson does not teach that the dental article form is self-supporting and malleable. Furthermore, Wilson state that “it is an important feature of the present invention that the side wall, or walls, 20 are essentially straight, as contrasted to existing art wherein the sidewalls have a distinct negative draft” (col. 3, lines 61-64, emphasis added). That is, straight sidewalls are seen as necessary for removal of the form. Neither Simor nor Neustadter et al. disclose dental article forms with straight sidewalls.

It is respectfully submitted that each of the elements of the claimed invention is not shown in the cited documents, but even if they were, there is no motivation to combine the cited documents. Even if there were such motivation to combine them, there is no enabling teaching

or suggestion of a dental article form that is formed from an organic composition, wherein the organic composition is itself both self-supporting and malleable, wherein the organic composition is in the form of a self-supporting structure that includes a reservoir as a container to hold a hardenable dental material, and further wherein the dental article form can be used in the patient's mouth and reshaped while in the patient's mouth.

It is submitted that the rejections may only be made by impermissible hindsight reconstruction, that is, by picking and choosing from each document that which supports these rejections. One cannot "simply [to] engage in a hindsight reconstruction of the claimed invention, using the Applicant's structure as a template and selecting elements from references to fill the gaps." *In re Gorman*, 933 F.2d 982, 18 U.S.P.Q.2d 1885, 1888 (Fed. Cir. 1991).

As recently asserted in *Princeton Biochemicals, Inc. v. Beckman Coulter, Inc.* 411 F.3d 1332, 75 U.S.P.Q.2d 1051 (Fed. Cir. 2005), 35 U.S.C. §103 specifically requires an assessment of the claimed invention "as a whole." The "as a whole" assessment of the invention requires a showing that an artisan of ordinary skill in the art at the time of the invention, confronted by the same problems as the inventor and with no knowledge of the claimed invention, would have selected the various elements from the cited references and combined them in the claimed manner. In other words, 35 U.S.C. §103 requires some suggestion or motivation, before the invention itself, to make the new combination. See *In re Rouffet*, 149 F.3d 1350, 1355-56, 47 U.S.P.Q.2d 1453, 1457-58 (Fed. Cir. 1998).

In *KSR Int'l co. v. Teleflex Inc.*, 127 S.Ct. 1727; 167 L.Ed.2d 705; 82 USPQ2d (BNA) 1385 (2007), the U.S. Supreme Court has acknowledged the utility of this "teaching, suggestion, motivation" inquiry when determining the obviousness of an invention by recognizing that the inquiry arose from "helpful insight" of the Court of Customs and Patent Appeals. The inquiry arose as a guard against a finding of obviousness where an examiner or a court was able to find all of the elements of an invention in the prior art, but without any suggestion or motivation to combine the prior art references that described the elements in question. The Supreme Court reiterated that "a patent composed of several elements is not proved obvious merely by

demonstrating that each of its elements was, independently, known in the prior art.” 167 L.Ed.2d at 14.

Furthermore, this “as a whole” instruction in 35 U.S. §103 prevents evaluation of the invention part by part, aided by the template of Applicants’ disclosure. Without this important requirement, an obviousness assessment might reduce an invention into its component parts, then find a reference corresponding to each component. This type of assessment would import hindsight into the obviousness determination by using the invention as a roadmap to find its prior art components. The U.S. Supreme Court cautioned against such analysis in *KSR*, stating, “A factfinder should be aware, of course, of the distortion caused by hindsight bias and must be cautious of arguments reliant upon *ex post* reasoning.” (167 L.Ed.2d at 725, citing *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1 (1966), warning against a “temptation to read into the prior art the teachings of the invention in issue” and instructing courts to “guard against slipping into the use of hindsight” (383 U.S., at 36, quoting *Monroe Auto Equipment Co. v. Heckthorn Mfg. & Supply Co.*, 332 F. 2d 406, 412 (CA6 1964))).

Finally, Uthoff and Kahn do not provide that which is missing from the other cited documents. As such, Applicants respectfully submit that each of the claims is not obvious. Applicants respectfully requests reconsideration and withdrawal of the rejection under 35 U.S.C. §103(a).

Obviousness-Type Double Patenting Rejection

The Examiner rejected claims 39 and 42-64 as provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-54, 56-73, 75, and 79-88 of copending Application No. 10/219,398 in view of Neustadter et al. (U.S. Patent No. 3,565,387). It is noted that copending Application No. 10/219,398 has not yet issued.

This rejection is traversed, particularly in view of the above discussion of Neustadter et al.; however, in the event that the rejection is maintained it will be addressed upon an indication of otherwise allowable subject matter.

Amendment and Response

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Filed: 19 August 2003

For: DENTAL ARTICLE FORMS AND METHODS

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Summary

It is respectfully submitted that all the pending claims are in condition for allowance and notification to that effect is respectfully requested. The Examiner is invited to contact Applicants' Representatives, at the below-listed telephone number, if it is believed that prosecution of this application may be assisted thereby.

Respectfully submitted

By

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August 21, 2007
Date

By:

Ann M. Muetting

Reg. No. 33,977

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CERTIFICATE UNDER 37 CFR § 1.810:

The undersigned hereby certifies that the Transmittal Letter and the paper(s), as described hereinabove, are being deposited with the United States Postal Service Express Mail[®] to the Patent and Trademark Office, addressed to Mail Stop RCE, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on this 21st day of August, 2007, at _____ (Central Time). Express Mail[®] mailing label number: EM 063174158 US,

By: Danielle Maloz
Name: Danielle Maloz



Receipt is hereby acknowledged for the following in the U.S. Patent and Trademark Office:

Applicant(s): Joel D. OXMAN et al.

Serial No.: 10/643,748

Filed: 19 August 2003

Title: DENTAL ARTICLE FORMS AND METHODS

Enclosed: Request for Continued Examination (RCE) Transmittal (1 pg, in duplicate); Amendment and Response (15 pgs.); Petition for Extension of Time (1 pg); Supplemental Information Disclosure Statement (2 pgs); copies of 0 applications; 1449 forms (2 pgs); and copies of 12 documents cited on the 1449 forms; and transmittal document (in triplicate).

Mailed: August 21, 2007
Docket: 58614US002

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s): Joel D. OXMAN et al.

Group Art Unit: 3732

Serial No.: 10/643,748

Examiner: John J. Wilson

Filed: 19 August 2003

Docket No.: 58614US002

Confirmation No.: 4133

Title: DENTAL ARTICLE FORMS AND METHODS

Mail Stop RCE

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P.O. Box 1450
Alexandria, VA 22313-1450

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PATENT
Docket No. 58614US002

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s): Oxman et al.	)	Group Art Unit:	3732
)		
Serial No.: 10/643,748	)	Examiner:	John J. Wilson
Confirmation No.: 4133)		
)		
Filed: 19 August 2003)		
)		
For: DENTAL ARTICLE FORMS AND METHODS)		

AMENDMENT AND RESPONSE

Commissioner for Patents
Mail Stop Amendment
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

In response to the Office Action mailed 24 October 2007, please amend the above-identified application as follows:

Amendments to the Claims are reflected in the listing of claims which begins on the page entitled "Amendments to the Claims."

Remarks begin on the page entitled "Remarks."

Amendments to the Claims

This listing of claims replaces all prior versions, and listings, of claims in the above-identified application:

1-38. (Cancelled)

39. (Currently Amended) A method of preparing a dental article, the method comprising:
- selecting a dental article form having a self-supporting structure comprising a first shape that includes a reservoir, wherein the self-supporting structure is formed from an organic composition having sufficient malleability to be formed into a second shape, wherein the organic composition gives the self-supporting structure its self-supporting and malleable characteristics, and further wherein the organic composition is dimensionally stable and comprises a surfactant system mixed therein;
 - filling the reservoir with one or more hardenable dental materials;
 - placing the dental article form filled with one or more hardenable dental materials on a subject's tooth structure;
 - at least partially hardening the hardenable material to form the dental article;
 - optionally customizing the dental article outside of the subject's mouth;
 - cementing the dental article to the subject's tooth structure; and
 - removing the dental article form from the article;
- wherein the dental article form is reshaped while in the subject's mouth ~~before or after~~ filling the reservoir with the hardenable dental material.

40-41. (Cancelled)

42. **(Previously Presented)** The method of claim 39 wherein the organic composition is curable.
43. **(Original)** The method of claim 42 wherein the curable organic composition comprises an initiator system and a resin system comprising at least one ethylenically unsaturated component.
44. **(Previously Presented)** The method of claim 39 wherein the organic composition is noncurable.
45. **(Currently Amended)** A method of preparing a dental article, the method comprising:
- selecting a dental article form having a self-supporting structure comprising a first shape that includes a reservoir, wherein the self-supporting structure is formed from an organic composition having sufficient malleability to be formed into a second shape, wherein the organic composition gives the self-supporting structure its self-supporting and malleable characteristics;
 - filling the reservoir with one or more hardenable dental materials;
 - placing the dental article form filled with one or more hardenable dental materials on a subject's tooth structure;
 - at least partially hardening the hardenable material in the reservoir to form the dental article;
 - optionally customizing the dental article outside of the subject's mouth;
 - cementing the dental article to the subject's tooth structure; and
 - removing the dental article form from the dental article;
- wherein the dental article form is reshaped while in the subject's mouth ~~before or after~~ filling the reservoir with the hardenable dental material.

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46. **(Previously Presented)** The method of claim 45 wherein the dental article form is removed after the dental article is cemented to the subject's tooth structure.
47. **(Previously Presented)** The method of claim 45 wherein the dental article form comprises an organic composition comprising a surfactant system mixed therein.
48. **(Previously Presented)** The method of claim 45 wherein the organic composition comprises a filler system.
49. **(Previously Presented)** The method of claim 45 wherein the organic composition is free of added filler.
50. **(Previously Presented)** The method of claim 45 wherein the organic composition is curable or noncurable.
51. **(Previously Presented)** The method of claim 50 wherein the organic composition is curable.
52. **(Previously Presented)** The method of claim 51 wherein the curable organic composition comprises an initiator system and a resin system comprising at least one ethylenically unsaturated component.
53. **(Previously Presented)** The method of claim 50 wherein the organic composition is noncurable.
54. **(Previously Presented)** The method of claim 53 wherein the noncurable organic composition comprises a noncurable polymer selected from the group consisting of a

polycaprolactone, a polyvinylacetate, and ethylene-vinyl acetate copolymer, a polyethylene glycol, a wax, and mixtures thereof.

55. **(Previously Presented)** The method of claim 45 wherein the dental article form is a form for a dental article selected from the group consisting of a crown, an inlay, an onlay, a bridge, an orthodontic appliance, a maxillofacial prosthesis, and a tooth splint.
56. **(Previously Presented)** The method of claim 45 wherein the dental article form is in packaging.
57. **(Previously Presented)** The method of claim 45 wherein the dental article form comprises one or more of the following features: a handle attached to the dental article form at a location removed from the base of the dental article form; a vented handle through which excess amounts of hardenable dental material can pass during placement of the dental article form; and one or more lines of weakness that may be separated.
58. **(Currently Amended)** A method of preparing a dental article, the method comprising:
- selecting a dental article form having a self-supporting structure comprising a first shape that includes a reservoir, wherein the self-supporting structure is formed from an organic composition having sufficient malleability to be formed into a second shape, wherein the organic composition gives the self-supporting structure its self-supporting and malleable characteristics;
 - filling the reservoir with one or more hardenable dental materials;
 - placing the dental article form filled with one or more hardenable dental materials on a subject's tooth structure;
 - hardening the hardenable material in the reservoir to form the dental article and cement it to the subject's tooth structure; and

removing the dental article form from the dental article;

wherein the dental article form is reshaped while in the subject's mouth ~~before or~~ after filling the reservoir with the hardenable dental material.

59. **(Previously Presented)** The method of claim 58 wherein the dental article form comprises an organic composition comprising a surfactant system mixed therein.
60. **(Previously Presented)** The method of claim 58 wherein the organic composition is curable or noncurable.
61. **(Previously Presented)** The method of claim 60 wherein the organic composition is curable.
62. **(Previously Presented)** The method of claim 61 wherein the curable organic composition comprises an initiator system and a resin system comprising at least one ethylenically unsaturated component.
63. **(Previously Presented)** The method of claim 60 wherein the organic composition is noncurable.
64. **(Previously Presented)** The method of claim 63 wherein the noncurable organic composition comprises a noncurable polymer selected from the group consisting of a polycaprolactone, a polyvinylacetate, and ethylene-vinyl acetate copolymer, a polyethylene glycol, a wax, and mixtures thereof.
65. **(Currently Amended)** A method of preparing a dental article, the method comprising:

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selecting a dental article form having a self-supporting structure comprising a first shape that includes a reservoir, wherein the self-supporting structure is formed from an organic composition having sufficient malleability to be formed into a second shape, wherein the dental article form does not include slots;

filling the reservoir with one or more hardenable dental materials;

placing the dental article form filled with one or more hardenable dental materials on a subject's tooth structure;

at least partially hardening the hardenable material in the reservoir to form the dental article;

optionally customizing the dental article outside of the subject's mouth;

cementing the dental article to the subject's tooth structure; and

removing the dental article form from the dental article;

wherein the dental article form is reshaped while in the subject's mouth ~~before or after~~ filling the reservoir with the hardenable dental material.

66. **(Currently Amended)** A method of preparing a dental article, the method comprising:

selecting a dental article form having a self-supporting structure comprising a first shape that includes a reservoir, wherein the self-supporting structure is formed from an organic composition having sufficient malleability to be formed into a second shape, wherein the dental article form does not include slots;

filling the reservoir with one or more hardenable dental materials;

placing the dental article form filled with one or more hardenable dental materials on a subject's tooth structure;

hardening the hardenable material in the reservoir to form the dental article and cement it to the subject's tooth structure; and

removing the dental article form from the dental article;

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wherein the dental article form is reshaped while in the subject's mouth ~~before or~~ after filling the reservoir with the hardenable dental material.

67. (New) The method of claim 39 wherein the dental article formed, upon removal of the dental article form, is selected from the group consisting of a crown, an inlay, an onlay, a bridge, an orthodontic appliance, a maxillofacial prosthesis, and a tooth splint.
68. (New) The method of claim 45 wherein the dental article formed, upon removal of the dental article form, is selected from the group consisting of a crown, an inlay, an onlay, a bridge, an orthodontic appliance, a maxillofacial prosthesis, and a tooth splint.
69. (New) The method of claim 58 wherein the dental article formed, upon removal of the dental article form, is selected from the group consisting of a crown, an inlay, an onlay, a bridge, an orthodontic appliance, a maxillofacial prosthesis, and a tooth splint.
70. (New) The method of claim 65 wherein the dental article formed, upon removal of the dental article form, is selected from the group consisting of a crown, an inlay, an onlay, a bridge, an orthodontic appliance, a maxillofacial prosthesis, and a tooth splint.
71. (New) The method of claim 66 wherein the dental article formed, upon removal of the dental article form, is selected from the group consisting of a crown, an inlay, an onlay, a bridge, an orthodontic appliance, a maxillofacial prosthesis, and a tooth splint.

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Remarks

The Office Action mailed 24 October 2007 has been received and reviewed. Claims 39, 45, 58, 65, and 66 having been amended, and claims 67 through 71 having been added, the pending claims are claims 39 and 42-71. Reconsideration and withdrawal of the rejections are respectfully requested.

Double Patenting Rejection

Claims 39 and 42-66 were rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-54, 56-73, 75, and 79-88 of copending Application No. 10/219,398 in view of Neustadter U.S. Patent No. 3,565,387. Upon an indication of otherwise allowable subject matter and in the event this rejection is maintained, Applicants will provide an appropriate response.

The 35 U.S.C. §103 Rejections

The Examiner rejected claims 39 and 42-44 under 35 U.S.C. §103(a) as being unpatentable over Simor (U.S. Patent No. 3,585,723) in view of Neustadter et al. (U.S. Patent No. 3,565,387), Ivanov et al. (U.S. Patent No. 4,113,499) and Wilson (U.S. Patent No. 5,487,663). The Examiner rejected claims 45, 46, 48-55, 58, and 60-66 under 35 U.S.C. §103(a) as being unpatentable over Simor (U.S. Patent No. 3,585,723) in view of Neustadter et al. (U.S. Patent No. 3,565,387) and Wilson (U.S. Patent No. 5,487,663). The Examiner rejected claims 47 and 59 under 35 U.S.C. §103(a) as being unpatentable over Simor (U.S. Patent No. 3,585,723) in view of Neustadter et al. (U.S. Patent No. 3,565,387) and Wilson (U.S. Patent No. 5,487,663) as applied to claim 45, and further in view of Ivanov et al. (U.S. Patent No. 4,113,499). The Examiner rejected claims 56 under 35 U.S.C. §103(a) as being unpatentable over Simor (U.S. Patent No. 3,585,723) in view of Neustadter et al. (U.S. Patent No. 3,565,387) and Wilson (U.S. Patent No. 5,487,663) as applied to claim 45, and further in view of Uthoff (U.S. Patent No. 5,102,332). The Examiner rejected claims 57 under 35 U.S.C. §103(a) as being

unpatentable over Simor (U.S. Patent No. 3,585,723) in view of Neustadter et al. (U.S. Patent No. 3,565,387) and Wilson (U.S. Patent No. 5,487,663) as applied to claim 45, and further in view of Kahn (U.S. Patent No. 3,949,476). These rejections are respectfully traversed; however, in the interest of expediting prosecution, each independent claim has been amended. Withdrawal of each of these rejections is respectfully requested.

Each independent claim has been amended to recite that the dental article form is reshaped while in the subject's mouth after filling the reservoir with the hardenable dental material. None of the cited documents teach or suggest this reshaping of the dental article form in the mouth after filling its reservoir with a hardenable dental material. As stated in Applicants' specification, "[t]he dental article form is sufficiently malleable in the oral environment such that the filled article form is easily customizable, which includes, for example, adjustment to width and marginal contacts of the crown form. This customization is done while the filled dental article form is seated on the prepared tooth stump, and while the hardenable dental material is still in the unhardened stage. The customization can be done by a variety of methods including applying pressure with fingers or an instrument of choice (e.g., hand operation of dental composite instrument) to provide optimum custom fit, including gingival, proximal, and occlusal fit." (Applicants' specification at page 13, lines 17-25).

In the case of a crown, the present invention provides a dental crown form having a reservoir filled with a material that will form the ultimate crown (after removal of the crown form). The crown form is then reshaped with the hardenable dental material in it while on a tooth stump, thereby causing the material in the reservoir to adopt the shape of the crown form. The hardenable dental material is at least partially hardened to form a dental crown, and then the crown form (used to form or mold the crown) is removed.

None of the cited references, used in any combination, teaches or suggests this reshaping step in the mouth after filling the reservoir. Not only do the combinations of documents lack the teaching of the desire to have a dental article form that can be reshaped in the mouth while a

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hardenable material for forming an ultimate dental article is within the reservoir of the form, there is no teaching or suggestion of how this could be accomplished.

Simor does not teach a crown form or the reshaping thereof. Simor teaches reshaping a crown per se while dental cement is between the crown and the tooth stump (e.g., col. 6, lines 55-58 and col. 8, lines 65-71). This cement is not, however, a hardenable material that forms a dental article upon removal of a form that shapes the dental article, particularly (as recited in new claims 67 through 71) a dental article selected from the group consisting of a crown, an inlay, an onlay, a bridge, an orthodontic appliance, a maxillofacial prosthesis, and a tooth splint).

Although Neustadter et al. teach a dental pattern, e.g., a crown form, there is no reshaping of the pattern in the subject's mouth after filling the reservoir with a hardenable dental material that ultimately forms the dental article. The pattern is used in a casting process, which may involve the use of wax (with the wax being eventually burned out). Furthermore, as stated in Applicants' previous response, simple reference to polyvinyl acetate, polyethylene and copolymers thereof does not necessarily provide sufficient description for one of skill in the art to select a composition that is both self-supporting and malleable. Thus, Neustadter et al. do not provide an enabling disclosure for selection of a composition that is malleable and self-supporting.

The Examiner cited Wilson for a disclosure of removing the dental article form from the dental article. Wilson does not, however, teach that the dental article form is self-supporting and malleable. Nor does Wilson teach reshaping the dental article form in the subject's mouth. The reshaping discussed at column 4, lines 8-24, refers to reshaping the composite material remaining after removal of the crown form.

There is no logical reason why one of skill in the art would combine the teachings of these three documents as proposed in support of this rejection. Even if there were such a reason, the organic composition of Neustadter et al. would be used to make the crown of Simor, which is not a crown form that is removed to form the ultimate crown. Furthermore, even with Wilson combined with Simor and Neustadter et al., there is no suggestion of reshaping a dental article

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form in the subject's mouth, particularly after filling the reservoir (of the dental article form) with the hardenable dental material that forms the ultimate dental article.

Furthermore, with respect to claims including a surfactant, although Ivanov et al. disclose a surfactant mixed in a disposable mold form, Ivanov et al. is directed to molds used in the foundry industry, a completely nonanalogous technology area, and used for a completely different purpose. There is no teaching or suggestion that such molds could be used in a dental method, or any reason to believe that the compositions of such molds would be suitable for modification to be used in a dental article form in a subject's mouth.

Finally, Uthoff and Kahn do not provide that which is missing from the other cited documents. As such, Applicants respectfully submit that each of the claims is not obvious. Applicants respectfully request reconsideration and withdrawal of the rejections under 35 U.S.C. §103(a).

It is submitted that the rejections may only be made by impermissible hindsight reconstruction, that is, by picking and choosing from each document that which supports these rejections. One cannot "simply [to] engage in a hindsight reconstruction of the claimed invention, using the Applicant's structure as a template and selecting elements from references to fill the gaps." *In re Gorman*, 933 F.2d 982, 18 U.S.P.Q.2d 1885, 1888 (Fed. Cir. 1991).

As recently asserted in *Princeton Biochemicals, Inc. v. Beckman Coulter, Inc.* 411 F.3d 1332, 75 U.S.P.Q.2d 1051 (Fed. Cir. 2005), 35 U.S.C. §103 specifically requires an assessment of the claimed invention "as a whole." The "as a whole" assessment of the invention requires a showing that an artisan of ordinary skill in the art at the time of the invention, confronted by the same problems as the inventor and with no knowledge of the claimed invention, would have selected the various elements from the cited references and combined them in the claimed manner. In other words, 35 U.S.C. §103 requires some suggestion or motivation, before the invention itself, to make the new combination. See *In re Rouffet*, 149 F.3d 1350, 1355-56, 47 U.S.P.Q.2d 1453, 1457-58 (Fed. Cir. 1998).

In *KSR Int'l co. v. Teleflex Inc.*, 127 S.Ct. 1727; 167 L.Ed.2d 705; 82 USPQ2d (BNA) 1385 (2007), the U.S. Supreme Court has acknowledged the utility of this “teaching, suggestion, motivation” inquiry when determining the obviousness of an invention by recognizing that the inquiry arose from “helpful insight” of the Court of Customs and Patent Appeals. The inquiry arose as a guard against a finding of obviousness where an examiner or a court was able to find all of the elements of an invention in the prior art, but without any suggestion or motivation to combine the prior art references that described the elements in question. The Supreme Court reiterated that “a patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art.” 167 L.Ed.2d at 14.

Furthermore, this “as a whole” instruction in 35 U.S. §103 prevents evaluation of the invention part by part, aided by the template of Applicants’ disclosure. Without this important requirement, an obviousness assessment might reduce an invention into its component parts, then find a reference corresponding to each component. This type of assessment would import hindsight into the obviousness determination by using the invention as a roadmap to find its prior art components. The U.S. Supreme Court cautioned against such analysis in *KSR*, stating, “A factfinder should be aware, of course, of the distortion caused by hindsight bias and must be cautious of arguments reliant upon *ex post* reasoning.” (167 L.Ed.2d at 725, citing *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1 (1966)). The Court also warned against a “temptation to read into the prior art the teachings of the invention in issue” and instructed courts to “‘guard against slipping into the use of hindsight’” (383 U.S., at 36, quoting *Monroe Auto Equipment Co. v. Heckthorn Mfg. & Supply Co.*, 332 F. 2d 406, 412 (CA6 1964))).

Applicants respectfully submit that these warnings have not been heeded and the rejections can on be supported by the use of impermissible hindsight reconstruction.

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For: DENTAL ARTICLE FORMS AND METHODS

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Summary

It is respectfully submitted that the pending claims 39 and 42-71 are in condition for allowance and notification to that effect is respectfully requested. The Examiner is invited to contact Applicants' Representatives, at the below-listed telephone number, if it is believed that prosecution of this application may be assisted thereby.

Respectfully submitted

By

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24 JAN. 2008
Date

By: Kevin W. Raasch
Kevin W. Raasch
Reg. No. 35,651
Direct Dial (612) 305-1218

CERTIFICATE UNDER 37 CFR §1.8:

The undersigned hereby certifies that the Transmittal Letter and the paper(s), as described hereinabove, are being transmitted by facsimile in accordance with 37 CFR §1.6(d) to the Patent and Trademark Office, addressed to **Mail Stop Amendment**, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on this 24th day of January, 2008, at 4:28 pm (Central Time).

By: Dani Moroz
Name: Dani Moroz



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PATENT
Docket No. 58614US002

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s): Oxman et al.	)	Group Art Unit: 3732
Serial No.: 10/643,748	)	Examiner: John J. Wilson
Confirmation No.: 4133)	
Filed: 19 August 2003)	
For: DENTAL ARTICLE FORMS AND METHODS)	

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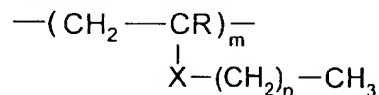
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Amendments to the Claims

This listing of claims replaces all prior versions, and listings, of claims in the above-identified application:

1. **(Cancelled)**
2. **(Withdrawn and Previously Presented)** The dental product of claim 41 wherein the hardenable composition has a sufficient malleability to be formed into a second shape at room temperature.
3. **(Withdrawn and Previously Presented)** The dental product of claim 41 wherein the filler system is greater than 70 wt-%.
4. **(Withdrawn and Previously Presented)** The dental product of claim 41 wherein at least a portion of the filler system comprises particulate filler.
5. **(Withdrawn and Previously Presented)** The dental product of claim 41 wherein upon hardening the structure in the second shape, the hardened structure has a flexural strength of at least about 25 MPa.
6. **(Withdrawn and Currently Amended)** The dental product of claim 41 wherein the crystalline resin component comprises a reactive group.
7. **(Withdrawn and Currently Amended)** The dental product of claim 41 wherein the crystalline resin component comprises polyesters, polyethers, polyolefins, polythioethers, polyarylalkylenes, polysilanes, polyamides, polyurethanes, or combinations thereof.

8. **(Withdrawn and Currently Amended)** The dental product of claim 7 wherein the crystalline resin component comprises saturated, linear, aliphatic polyester polyols containing primary hydroxyl end groups.
9. **(Withdrawn and Previously Presented)** The dental product of claim 8 wherein the hydroxyl end groups are modified to introduce polymerizable unsaturated functional groups.
10. **(Withdrawn and Currently Amended)** The dental product of claim 41 wherein the crystalline resin component is a polymeric material having crystallizable pendant moieties and the following general formula:



wherein R is hydrogen or a (C₁-C₄)alkyl group, X is --CH₂--, --C(O)O--, --O-C(O)--, --C(O)-NH--, --HN-C(O)--, --O--, --NH--, --O-C(O)-NH-, --HN-C(O)-O-, --HN-C(O)-NH--, or --Si(CH₃)₂--, m is the number of repeating units in the polymer, and n is great enough to provide sufficient side chain length and conformation to form polymers containing crystalline domains or regions.

11. **(Withdrawn and Previously Presented)** The dental product of claim 41 wherein the filler system comprises an inorganic material comprising nanoscopic particles.
12. **(Withdrawn and Previously Presented)** The dental product of claim 11 wherein the inorganic material comprises surface hydroxyl groups.

13. **(Withdrawn and Previously Presented)** The dental product of claim 41 wherein the hardenable composition further comprises a surfactant system.
14. **(Withdrawn and Previously Presented)** The dental product of claim 41 wherein the hardenable composition has a G' value of about 100 kPa to about 50,000 kPa at a frequency of about 0.005 Hz.
15. **(Withdrawn and Currently Amended)** The dental product of claim 41 wherein the crystalline resin component has a dendritic, hyperbranched, or a star-shaped structure.
16. **(Cancelled)**
17. **(Withdrawn and Previously Presented)** The dental product of claim 44 wherein upon hardening the structure in the second shape, the hardened structure does not require an additional veneering material for the hardened dental product.
18. **(Cancelled)**
19. **(Withdrawn and Previously Presented)** The dental product of claim 47 wherein the filler system is present in an amount greater than 50 wt-%, based on the total weight of the composition.
20. **(Withdrawn and Previously Presented)** The dental product of claim 47 wherein the hardenable self-supporting structure having a first shape has sufficient malleability to be formed into a second shape at a temperature of about 15°C to 38°C.

21. **(Withdrawn and Previously Presented)** The dental product of claim 20 wherein the hardenable self-supporting structure having a first shape has sufficient malleability to be formed into a second shape substantially similar to the first shape.
22. **(Withdrawn and Previously Presented)** The dental product of claim 47 wherein if the filler system comprises fibers, the fibers are present in an amount of less than 20 wt-%, based on the total weight of the composition.
23. **(Withdrawn and Currently Amended)** The dental product of claim 47 wherein the resin system further comprises a noncrystalline resin component.
24. **(Withdrawn and Currently Amended)** The dental product of claim ~~[[23]]~~ 47 wherein the crystalline resin component has a dendritic, hyperbranched, or a star-shaped structure.
25. **(Withdrawn and Previously Presented)** The dental product of claim 47 wherein upon hardening the structure in the second shape, the hardened structure has a flexural strength of at least about 25 MPa.
26. **(Withdrawn and Currently Amended)** A dental product comprising a hardenable composition; wherein the hardenable composition comprises:
 - a resin system comprising at least one ethylenically unsaturated component and a crystalline resin component;
 - greater than 60 wt-% of a filler system; and
 - an initiator system;
 - wherein the composition is in the form of a hardenable self-supporting structure having a first shape and sufficient malleability to be formed into a second shape at a temperature of about 15°C to 38°C.

27. **(Withdrawn and Previously Presented)** The dental product of claim 26 with the proviso that if the filler system comprises fibers, the fibers are present in an amount of less than 20 wt-%, based on the total weight of the composition.
28. **(Withdrawn and Currently Amended)** The dental product of claim 26 wherein the ethylenically unsaturated component is the crystalline resin component.
29. **(Withdrawn and Currently Amended)** The dental product of claim 26 wherein the crystalline resin component has a dendritic, hyperbranched, or a star-shaped structure.
30. **(Withdrawn and Previously Presented)** The dental product of claim 26 wherein the hardenable composition further comprises a surfactant system and the filler system comprises a micron-size particulate filler and a nanoscopic particulate filler.
31. **(Withdrawn and Currently Amended)** A dental product comprising a hardenable composition; wherein the hardenable composition comprises:
- a resin system comprising at least one ethylenically unsaturated component and a crystalline resin component;
 - greater than 50 wt-% of a filler system at least a portion of which is an inorganic material comprising nanoscopic particles having an average primary particle size of no greater than about 50 nm;
 - an initiator system; and
 - a surfactant system;
- wherein the composition is in the form of a hardenable self-supporting structure having a first shape and sufficient malleability to be formed into a second shape.

32. **(Withdrawn and Previously Presented)** The dental product of claim 31 wherein the hardenable self-supporting structure having a first shape has sufficient malleability to be formed into a second shape at a temperature of about 15°C to 38°C.
33. **(Withdrawn and Previously Presented)** The dental product of claim 31 wherein the filler system further comprises a micron-size particulate filler.
34. **(Withdrawn and Currently Amended)** The dental product of claim 31 wherein the ~~resin system further comprises a~~ crystalline resin component is the reaction product of hydroxyl-terminated polycaprolactone and 2-isocyanatoethyl methacrylate.
35. **(Withdrawn and Currently Amended)** A dental product comprising a hardenable composition; wherein the hardenable composition comprises:
- a resin system comprising:
- a noncrystalline component selected from the group consisting of mono-, di-, or poly- acrylates and methacrylates, unsaturated amides, vinyl compounds, and combinations thereof;
- a crystalline resin component selected from the group consisting of polyesters, polyethers, polyolefins, polythioethers, polyarylalkylenes, polysilanes, polyamides, polyurethanes, and polymeric materials having crystallizable pendant moieties and the following general formula:
- $$\begin{array}{c} \text{---}(\text{CH}_2\text{---CR})_m\text{---} \\ | \\ \text{X---}(\text{CH}_2)_n\text{---CH}_3 \end{array}$$
- wherein:
- R is hydrogen or a (C₁-C₄)alkyl group, X is --CH₂--,
- C(O)O--, --O-C(O)--, --C(O)-NH--, --HN-C(O)--, --O--,

--NH--, --O-C(O)-NH-, --HN-C(O)-O-, --HN-C(O)-NH-,
or --Si(CH₃)₂--;

m is the number of repeating units in the polymer; and

n is great enough to provide sufficient side chain length and
conformation to form polymers containing crystalline domains or regions,
and combinations thereof;

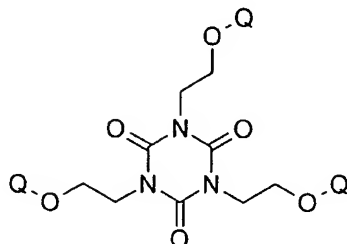
greater than 60 wt-% of a filler system; and

an initiator system;

wherein the composition is in the form of a hardenable self-supporting structure
having a first shape and sufficient malleability to be formed into a second shape at a
temperature of about 15°C to 38°C;

with the proviso that if the filler system comprises fibers, the fibers are present in
an amount of less than 20 wt-%, based on the total weight of the composition.

36. **(Withdrawn and Previously Presented)** The dental product of claim 35 wherein the hardenable composition further comprises a surfactant system and the filler system further comprises a nanoscopic particulate filler.
37. **(Withdrawn and Previously Presented)** The dental product of claim 35 wherein the filler system further comprises a micron-size particulate filler.
38. **(Withdrawn and Currently Amended)** A dental product comprising a hardenable composition; wherein the hardenable composition comprises:
a resin system comprising a crystalline resin component comprising a compound of the formula:



wherein each Q independently comprises polyester segments, polyamide segments, polyurethane segments, polyether segments, or combinations thereof;

a filler system; and

an initiator system;

wherein the composition is in the form of a hardenable self-supporting structure having a first shape and sufficient malleability to be formed into a second shape.

39. **(Withdrawn and Previously Presented)** The dental product of claim 38 wherein each Q independently comprises poly(caprolactone) segments.
40. **(Withdrawn and Previously Presented)** The dental product of claim 38 wherein the crystalline compound comprises polymerizable groups.
41. **(Currently Amended)** A dental product comprising a hardenable composition, wherein the hardenable composition comprises:
- a resin system comprising a crystalline resin component;
 - greater than 60 wt-% of a filler system; and
 - an initiator system;
- wherein the hardenable composition is in the form of a hardenable self-supporting structure having a first shape and sufficient malleability to be formed into a second shape at a temperature of about 15°C to 38°C;

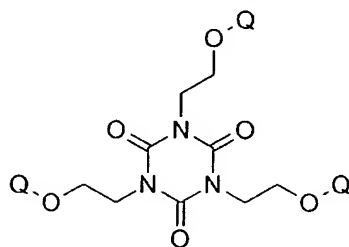
with the proviso that if the filler system comprises fibers, the fibers are present in an amount of less than 20 wt-%, based on the total weight of the composition.

42. **(Original)** The dental product of claim 41 which is a preformed crown, a preformed inlay, a preformed onlay, a preformed bridge, a preformed veneer, a preformed orthodontic appliance, a preformed maxillofacial prosthesis, a preformed tooth facsimile, or a preformed tooth splint.
43. **(Withdrawn)** The dental product of claim 41 which is a filling material.
44. **(Currently Amended)** A dental product comprising a hardenable composition, wherein the hardenable composition comprises:
 - a resin system comprising a crystalline resin component;
 - greater than 70 wt-% of a filler system; and
 - an initiator system;wherein the hardenable composition is in the form of a hardenable self-supporting structure having a first shape and sufficient malleability to be formed into a second shape;
 - with the proviso that if the filler system comprises fibers, the fibers are present in an amount of less than 20 wt-%, based on the total weight of the composition.
45. **(Original)** The dental product of claim 44 which is a preformed crown, a preformed inlay, a preformed onlay, a preformed bridge, a preformed veneer, a preformed orthodontic appliance, a preformed maxillofacial prosthesis, a preformed tooth facsimile, or a preformed tooth splint.
46. **(Withdrawn)** The dental product of claim 44 which is a filling material.

47. **(Currently Amended)** A dental product comprising a hardenable composition, wherein the hardenable composition comprises:
- a resin system comprising a crystalline resin component;
 - a filler system comprising inorganic nanoscopic particles having an average primary particle size of no greater than about 50 nm;
 - a surfactant system; and
 - an initiator system;
- wherein the hardenable composition is in the form of a hardenable self-supporting structure having a first shape and sufficient malleability to be formed into a second shape.
48. **(Original)** The dental product of claim 47 which is a preformed crown, a preformed inlay, a preformed onlay, a preformed bridge, a preformed veneer, a preformed orthodontic appliance, a preformed maxillofacial prosthesis, a preformed tooth facsimile, or a preformed tooth splint.
49. **(Withdrawn and Previously Presented)** The dental product of claim 47 which is a filling material.
50. **(Withdrawn and Currently Amended)** A dental impression tray comprising a hardenable composition, wherein the hardenable composition comprises:
- a resin system comprising a crystalline resin component;
 - a filler system comprising inorganic nanoscopic particles having an average primary particle size of no greater than about 50 nm;
 - a surfactant system; and
 - an initiator system;
- wherein the hardenable composition is in the form of a hardenable self-supporting structure having a first shape and sufficient malleability to be formed into a second shape.

51. **(Withdrawn)** The dental impression tray of claim 50 wherein the self-supporting structure has at least one structured surface.
52. **(Withdrawn)** The dental impression tray of claim 51 wherein the structured surface is formed by a porous substrate.
53. **(Withdrawn)** The dental impression tray of claim 51 wherein the structured surface is a microreplicated surface.
54. **(Currently Amended)** A preformed dental crown comprising a composition comprising a resin system, a filler system, and an initiator system;
wherein the resin system comprises a crystalline resin component;
wherein the composition is in the form of a hardenable self-supporting structure having a first shape and sufficient malleability to be formed into a second shape; and
wherein the hardenable self-supporting structure having a first shape has sufficient malleability to be formed into a second shape at a temperature of about 15°C to 38°C.
55. **(Cancelled)**
56. **(Original)** The preformed dental crown of claim 54 wherein the filler system is present in an amount greater than 60 wt-%, based on the total weight of the composition.
57. **(Original)** The preformed dental crown of claim 54 wherein the filler system is present in an amount greater than 70 wt-%, based on the total weight of the composition.

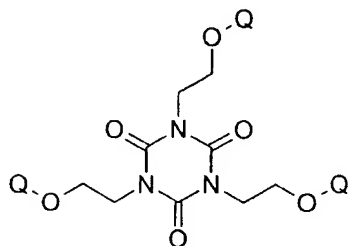
58. **(Original)** The preformed dental crown of claim 54 wherein upon forming the second shape and hardening the structure in the second shape, the hardened structure does not need an additional veneering material.
59. **(Original)** The preformed dental crown of claim 54 which is in packaging.
60. **(Previously Presented)** The preformed dental crown of claim 59 wherein the packaging is light-blocking packaging sufficient to protect the preformed dental crown from conditions that would activate the initiator system and cause premature hardening.
- 61-78. **(Cancelled)**
79. **(Previously Presented)** The preformed dental crown of claim 54 further comprising a resin material lining the crown.
80. **(Withdrawn and Previously Presented)** The preformed dental crown of claim 54 wherein the resin system comprises a compound of the formula:



wherein each Q independently comprises polyester segments, polyamide segments, polyurethane segments, polyether segments, or combinations thereof.

81. **(Withdrawn and Currently Amended)** A dental product comprising a composition, wherein the composition comprises:

a resin system comprising a crystalline resin component comprising a compound of the formula:



wherein each Q independently comprises polyester segments, polyamide segments, polyurethane segments, polyether segments, or combinations thereof;

a filler system; and

an initiator system;

wherein the composition is in the form of a hardenable self-supporting structure having a first shape and sufficient malleability to be formed into a second shape at a temperature of about 15°C to 38°C.

82. **(Withdrawn and Previously Presented)** The dental product of claim 81 which is a preformed crown, a preformed inlay, a preformed onlay, a preformed bridge, a preformed veneer, a preformed orthodontic appliance, a preformed maxillofacial prosthesis, a preformed tooth facsimile, or a preformed tooth splint.
83. **(Withdrawn and Previously Presented)** The dental product of claim 81 which is a filling material.
84. **(Currently Amended)** A dental product comprising a composition comprising:
a resin system comprising a noncrystalline resin component and a crystalline resin component;

greater than 60 wt-% of a filler system; and

an initiator system;

wherein the composition is in the form of a hardenable self-supporting structure having a first shape and sufficient malleability to be formed into a second shape at a temperature of about 15°C to 38°C;

with the proviso that if the filler system comprises fibers, the fibers are present in an amount of less than 20 wt-%, based on the total weight of the composition;

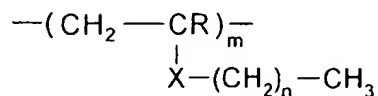
and further wherein the dental product is a preformed crown, a preformed inlay, a preformed onlay, a preformed bridge, a preformed veneer, a preformed orthodontic appliance, a preformed maxillofacial prosthesis, a preformed tooth facsimile, or a preformed tooth splint.

85. **(Withdrawn and Currently Amended)** A dental product comprising a composition comprising:

a resin system comprising:

a noncrystalline resin component selected from the group consisting of mono-, di-, or poly- acrylates and methacrylates, unsaturated amides, vinyl compounds, and combinations thereof;

a crystalline resin component selected from the group consisting of polyesters, polyethers, polyolefins, polythioethers, polyarylalkylenes, polysilanes, polyamides, polyurethanes, and polymeric materials, and combinations thereof, wherein the polymeric materials have crystallizable pendant moieties and the following general formula:



wherein:

R is hydrogen or a (C₁-C₄)alkyl group, X is --CH₂--,
 --C(O)O--, --O-C(O)--, --C(O)-NH--, --HN-C(O)--, --O--,
 --NH--, --O-C(O)-NH-, --HN-C(O)-O-, --HN-C(O)-NH--,
 or --Si(CH₃)₂--;

m is the number of repeating units in the polymer; and

n is great enough to provide sufficient side chain length and
 conformation to form polymers containing crystalline domains or regions,
 and combinations thereof;

greater than 60 wt-% of a filler system; and

an initiator system;

wherein the composition is in the form of a hardenable self-supporting structure
 having a first shape and sufficient malleability to be formed into a second shape at a
 temperature of about 15°C to 38°C;

with the proviso that if the filler system comprises fibers, the fibers are present in
 an amount of less than 20 wt-%, based on the total weight of the composition.

86. **(Withdrawn and Currently Amended)** The dental product of claim 85 wherein the noncrystalline resin component comprises a mono-, di-, or poly- acrylate or methacrylate selected from the group consisting of methyl acrylate, methyl methacrylate, ethyl acrylate, isopropyl methacrylate, n-hexyl acrylate, stearyl acrylate, allyl acrylate, glycerol mono- and diacrylate, glycerol triacrylate, ethyleneglycol diacrylate, diethyleneglycol diacrylate, triethyleneglycol dimethacrylate, 1,3-propanediol diacrylate, 1,3-propanediol dimethacrylate, trimethylolpropane triacrylate, 1,2,4-butanetriol trimethacrylate, 1,4-cyclohexanediol diacrylate, pentaerythritol triacrylate, pentaerythritol tetraacrylate, pentaerythritol tetramethacrylate, sorbitol hexacrylate, bis(1-(2-acryloxy))-p-ethoxyphenyldimethylmethane, bis(1-(3-acryloxy-2-hydroxy))-p-propoxyphenyldimethylmethane, tris(hydroxyethylisocyanurate) trimethacrylate, 2-

hydroxyethyl methacrylate, 2-hydroxypropyl methacrylate, tetrahydrofurfuryl methacrylate, ethylene glycol dimethacrylate, triethylene glycol dimethacrylate, bisGMA, ethoxylated bisphenol A diacrylate, ethoxylated bisphenol A dimethacrylate, polyethylene glycol dimethacrylate, bis-acrylates and bis-methacrylates of polyethylene glycols of molecular weight 200-500, copolymerizable mixtures of acrylated monomers, and acrylated oligomers.

87. **(Withdrawn and Currently Amended)** The dental product of claim 85 wherein the crystalline resin component comprises a polyester.
88. **(Withdrawn and Currently Amended)** The dental product of claim 85 wherein the crystalline resin component comprises the reaction product of polycaprolactone diol with 2-isocyanatoethyl methacrylate, methacryloyl chloride, or methacrylic anhydride.
- 89-106. **(Cancelled)**